

**The Effects of Perturbations on Mother-Infant Interaction:
Studies of Hospitalization, Especially during the First
Six Months of Life**

Gunnel Elander

Malmö 1986

*Diss
Rimel*



Digitized by the Internet Archive
in 2026

https://archive.org/details/IA41552418_0011

Organization LUND UNIVERSITY		Document name DOCTORAL DISSERTATION	
		Date of issue	
		CODEN: LUMEDW/ (MEBM-1008) /1-43 (1986)	
Author(s) Gunnel Elander		Sponsoring organization	
Title and subtitle The Effects of Perturbations on Mother-Infant Interaction: Studies of Hospitalization, Especially During the First Six Months of Life.			
Abstract The present studies investigated the effects of separation on mothers and their newborns with regard to the mothers' experiences and their success in breast feeding. The infants' abilities to respond differently with different caregivers during hospitalization were investigated and caregivers' behavior was scored by using a special scale. Long term effects of hospitalization and/or daycare were analyzed by using a child behavior checklist. The results suggest: 1) Mothers should not be separated from their newborns unless absolutely necessary, e.g. because of the condition of the mother or the infant. A separation is traumatic for the mother-infant and results in a decrease in breast feeding. 2) If the baby has to have a special treatment it is important that the parents (usually the mothers) get involved and are given as much responsibility as possible for the infant's care. This is also true for infants who are hospitalized after the newborn period. The parents must not only be allowed to stay with their infants, they should be supported and encouraged to care for their infants during hospitalization. This is important not only for the mothers' self-esteem, but for the baby's welfare. 3) The infants are capable of recognizing different caregivers, a fact which emphasizes the importance of the main provider of care continuing as the caregiver when infants are hospitalized. 4) The behavior of children at the age of four who had been hospitalized was different from that of children who had not experienced hospitalization, but only if they had been using daycare outside home.			
Key words Infants, hospitalization, separation, breastfeeding, interaction			
Classification system and/or index terms (if any)			
Supplementary bibliographical information			Language English
Printed by Screen & Offset AB, Malmö			
ISSN and key title			ISBN
Recipient's notes		Number of pages 43	Price
		Security classification	

Distribution by (name and address)

I, the undersigned, being the copyright owner of the abstract of the above-mentioned dissertation, hereby grant to all reference sources permission to publish and disseminate the abstract of the above-mentioned dissertation.

Signature Gunnel Elander

Date 1986-08-11

THE EFFECTS OF PERTURBATIONS ON MOTHER-INFANT INTERACTION:
STUDIES OF HOSPITALIZATION, ESPECIALLY DURING THE FIRST SIX
MONTHS OF LIFE

AKADEMISK AVHANDLING

som med vederbörligt tillstånd av Medicinska Fakulteten vid
Lunds Universitet för avläggande av doktorsexamen i medicinsk
vetenskap kommer att offentligen försvaras i Universitetsklini-
kernas aula, Malmö Allmänna Sjukhus, fredagen den 31 oktober
1986 kl 13.15

av

Gunnel Elander

leg sjuksköterska, fil kand, Ld

From the Department of Paediatrics, Malmö General Hospital,
University of Lund, Sweden

The Effects of Perturbations on Mother-Infant Interaction:
Studies of Hospitalization, Especially during the First
Six Months of Life

Gunnel Elander

Malmö 1986

Printed by Screen & Offset AB
Malmö 1986



TO PARENTS

"In considering the best conditions for the relief for acutely sick infants and for foundlings or abandoned babies, two important factors must always be kept in mind, 1) the unusual susceptibility of the infant to its immediate environment and 2) its great need of individual care. The best conditions for the infant thus require a home and a mother".

Chapin 1915

This thesis is based on the following papers referred to in the text by Roman numerals:

- I. Elander G and Lindberg T:
Short Mother-Infant Separation during First Week of
Life Influences the Duration of Breastfeeding.
Acta Paediatr Scand 73:237-240, 1984.
- II. Elander G and Lindberg T:
Hospital Routines in Infants with Hyperbilirubinemia
Influence the Duration of Breastfeeding.
Acta Paediatr Scand 75:708-712, 1986.
- III. Elander G:
Effects on Breastfeeding in Infants Diagnosed as
Congenital Hip Joint Dislocation and Treated in the
von Rosen Splint.
Midwifery. In press 1986.
- IV. Elander G and Pannabecker BJ:
Caregiver-Infant Interaction: An Exploratory Study
of the Feeding Situation in Swedish Hospitals.
Submitted.
- V. Elander G, Nilsson A and Lindberg T:
Behavior in Four Year Old Children Who Have
Experienced Hospitalization and Daycare:
A Retrospective Study.
Am J Orthopsychiatry. In press 1986.

Contents

Introduction	7
Previous investigations	9
Infants' reactions to strangers and strange situations	9
Hospital routines: The impact on the mothers	11
Caregiver-infant interaction	12
Effects of hospitalization	13
Effects of daycare	14
Present investigation	15
Aims	15
Survey I and II	16
Study I-V	18
Infants and children	18
Methods	19
Results	22
Discussion	29
Separation in the newborn period	29
Infants separated by hospitalization before six months of age	31
Separation through hospitalization and daycare	33
General conclusion and summary	35
Acknowledgements	36
References	37
Article I	
Article II	
Article III	
Article IV	
Article V	
Appendices	

INTRODUCTION

Chapin was the promoter of the development of the Speedwell Society, which was founded in 1902 in New Jersey. The purpose of the Society was to organize private care for sick infants who otherwise would have been cared for in hospitals. Chapin stated in 1908 that "a hospital or institution of any kind should only serve as a temporary hold-up in case of acute illness of infants". In one of the hospitals in Chicago it was noted that the "nurses' pet" got along better than other infants. Therefore it became a rule that all infants should be picked up, carried and "mothered" several times a day (Brenneman 1932).

In order to protect full-term infants from infections (preterm infants were cared for in incubators), a cabinet cubicle was developed (Chapple 1940). Only two years later (Bakwin 1942) it was questioned whether these attempts at isolation might not have been harmful to the infants. In his article named "Loneliness in infants", Bakwin suggested that the young infants' need for warmth from the mother or a substitute is as strong as the need for nutritional satisfaction.

Lowrey (1940) studied a group of children who had been admitted to institutions at ages ranging from two weeks to 11 months. More than 50% of the children had been admitted before six months of age. He found that their clinical picture was similar to that of rejected children, but their personality distortion was more marked.

Although the circumstances 50 to 80 years ago were quite different in most aspects, it is amazing that the same questions are still of immediate interest. This investigation focuses on mother-infant dyads who have been separated by mild illness in the infant during the first six months of life.

The reason for investigating this age group is the limited knowledge about mother-infant separation in this age group, whereas comprehensive research is available in similar situations

in older infants and children (Spitz 1950, Ainsworth 1964, Bowlby 1969 and others).

Reasons for paying attention to infants suffering from mild illnesses are several: Many more infants suffer from mild illnesses rather than from severe ones and parents of these infants tend to receive less support than parents of very sick or premature infants. These facts are recognized by the mothers who do not want to bother the nurses who are busy taking care of seriously ill infants. However, all parents whose infants are ill are in need of attention and support regardless of the severity of the illness.

In 1981 approximately 10% (about 10,000) of all newborn infants in Sweden were admitted to a neonatal ward for minor health problems that required a stay of 1-2 days (de Chateau 1983). According to de Chateau many of these infants were admitted and thus separated from their mothers because of staff problems, usually due to inexperienced physicians and nurses.

This investigation highlights the importance of not separating mother and infant because of organization, staff problems or hospital routines. Firm and inflexible hospital routines lead to unnecessary separation between mothers and infants, a problem which is emphasized through this study.

PREVIOUS INVESTIGATIONS

At the beginning of this century the advantages of caring for sick infants outside hospitals were reported (Chapin 1908). Later it was demonstrated that in some institutions in the U.S.A. 100% of infants died before two years of age (Chapin 1915a). When cared for by a foster mother, two-thirds of sick infants under three months of age and three-quarters of sick infants aged three to six months were saved. Thus Chapin (1915b) emphasized that infants are unusually susceptible to the environment and have a critical need for individual care.

Brenneman (1932) suggested that the recovery of infants cared for at home could be due to the mother's sensitive observation of the infant and her rapid adjustment of the care to the infant's condition. The routinized care in the hospitals made such changes hard to accomplish.

Healthy infants who were admitted to the hospital because of ill mothers developed high fever ($38.3-41.7^{\circ}\text{C}$) after some time in the hospital. No cause of the fever was found (Bakwin 1944). The infants did not appear acutely ill but presented a clinical picture generally seen after prolonged stay in the hospital. The infants were described as being without facial expression, lying quietly in bed, rarely crying and moving very little (Bakwin 1949). This syndrome was seen in infants under six months of age.

Hospitalization of infants in this age group might affect the infants, the parents (especially the mothers) and the mother-infant interaction. The literature review will concentrate on these areas.

INFANTS' REACTIONS TO STRANGERS AND STRANGE ENVIRONMENTS

Schaffer (1959) investigated the behavior of 32 hospitalized infants under seven months of age and found a decrease in vocalization from the very first day in the hospital that persisted until

discharge. During the visiting hour the infants became more verbal, but relapsed into silence after the mother left. When the infants returned home (Schaffer 1958) a strange behavior, which Schaffer names "the global syndrome" was described. The infants were extremely preoccupied with the environment, scanning their surroundings. No vocalizations were heard and the infants' facial expressions were blank. In some cases attempts at contact from adults were ignored. In 50% of the group somatic upset occurred, usually sleep disturbances, but also feeding problems and vomiting.

A stranger, as experienced by an infant of three or four months is somebody who does things differently (Benjamin 1963). That involves auditory, tactile and kinesthetic discriminations such as strange voices and unfamiliar handling. In a few cases Benjamin found that infants as early as six to eight weeks of age cried when their mothers left.

In one study, eight out of eighteen infants at three months of age responded to a stranger by fussing, crying and turning away (Tennes and Lampl 1964). If the sight of a stranger was accompanied by touch, the fear response was intensified.

Yarrow (1972) found that three months old infants discriminated between the mother and a stranger by focusing attention on the mother and ignoring the stranger, or by intensive visual concentration on the stranger. The same author reported that five months old infants showed discomfort by frowning, crying and withdrawing physically when approached by a stranger.

Sander et al. (1970) demonstrated that infants cared for by a single caregiver showed less crying, more awake time in daytime and more sleep at night than infants cared for by multiple caregivers. These same investigators reported that more distress occurred during feedings when 10-day-old-infants who had been consistently cared for by a single caregiver were transferred to a second new caregiver (Burns et al. 1972).

These effects of multiple caregivers on young infants suggest that infants have capacities and needs that may not have been identified, or worse, were ignored when hospital routines were established. It is reasonable to assume that infants are able to distinguish between their mothers and other caregivers at an early age.

HOSPITAL ROUTINES: THE IMPACT ON THE MOTHERS

The importance of the first few days after birth for infant-mother attachment was reported almost 15 years ago (Klaus et al. 1972). During the 1970s many studies were performed to evaluate these findings. (See reviews by de Chateau 1977 and Hwang and Lamb 1982).

Attempts to replicate the Klaus et al. results have focused much attention to hospital routines during childbirth and the care of mothers and their newborns. Some studies that have investigated the influence of hospital routines on breast feeding will be summarized.

In a study in Guatemala City one group of mothers was separated from their infants after delivery for 12 to 24 hours, whereas in the experimental group the infants were given to their mothers on the delivery table. During 45 minutes together the mothers were encouraged to breast feed their infants. In two of the three hospitals involved, the extra-contact mothers breast fed for a significantly longer period than did control mothers (Sosa et al. 1976).

In Sweden a group of mothers had skin-to-skin contact with their infants for 15 minutes after the delivery. When they were compared with mothers who were cared for according to regular hospital routines, the extra-contact mothers breast fed for an average of two months longer (de Chateau 1976).

Bloom (1982) found, among other factors, that early post-partum contact, early initiation of breast feeding and rooming-in were positively associated with breast feeding.

In a recent study (Taylor et al. 1985), extra contact post partum was not found to be associated with prolonged breast feeding. Suckling, however, during extra contact was positively associated with breast feeding at two months. Since extra contact between the mothers and their newborns seems to increase the duration of breast feeding, it could be assumed that the reverse, separation, would decrease the duration of breast feeding.

CAREGIVER-INFANT INTERACTION

In the literature there are several terms that can be included in the overall concept of interaction.

Synchrony (Condon and Sander 1974) was used to describe the newborn infant's change of movements with the speech of adults. This type of synchrony was found in infants as early as 12 hours after birth. The correspondence occurred regardless of whether the voice came from a tape recorder or from an adult talking to the infant.

Reciprocity (Brazelton et al. 1974) was used to describe the visual interactional synchrony between infants aged 2 to 20 weeks and their mothers. Five mother-infant pairs were filmed during "optimal" interaction and were found to have cycles of attention followed by withdrawal of attention. The mother's sensitivity to the infant's capacity and his need for withdrawal were considered important for maintaining the interaction.

If the mother presented a still, unresponsive face to her infant, aged three weeks the infant became concerned and visibly attempted to draw the mother into interaction (Brazelton et al. 1975).

Interaction implies concurrent and/or related behaviors, such as mutual eye contact, the mother's vocalization following the infant's vocalization or the infant's vocalization or smiling

after having been touched or smiled at by the mother (Barnard 1978).

In the study by Sander et al. (1970) it was shown that different caretaker environments, which included interaction with different caregivers at the beginning of life, had an influence on the amount of infants' crying and the development of sleep patterns.

Barnard (1984) described the mother-infant interaction system as a dialogue, a mutually adaptive "dance" between partners. To participate in such a "dance" each partner has to have some skills. The mother has to be able to read the infant's cues and respond properly as well as to be able to give appropriate stimulation at the proper time. The infant has to give clear cues, to possess perceptual abilities and to respond to stimulation. Absence of these skills in the mother or the infant influences the quality of the mother-infant interaction pattern.

These interactional patterns as assessed by the Nursing Child Assessment Feeding Scale (Barnard 1978), have been found to correlate over time. Feeding synchrony assessed on the third day after birth was significantly correlated with feeding synchrony at 28 days in a sample of 45 infants (Quillan 1983). This method has been found to be very useful in assessing the behavior of caregivers and infants as well as the caregiver-infant interaction.

EFFECTS OF HOSPITALIZATION

Douglas (1975) found that 68% of preschool children who had been admitted to hospitals showed no disturbance or change in behavior on return home. Ten percent had improved in some behaviors and 22% deteriorated. The proportion of deteriorated behaviors rose to 38% if the children had been admitted to the hospital three or more times. The deterioration in behavior as reported by mothers was very low in infants who had been admitted to the hospital before six months of age. This study included children who had been admitted to the hospital in 1946 to 1951 when the hospital routines were different. Douglas' findings were confirmed by Quinton and

Rutter (1976). Single admissions, regardless of age, were not associated with emotional or conduct disturbance at age 10. Multiple admissions were linked with emotional disturbances in various psycho-socially disadvantaged groups.

It might be questioned whether health problems are associated with psycho-social circumstances. Swedish studies have shown that the correlation between health problems and socio-economic factors are weak or non-existent (Sundelin and Vuille 1979). The same authors suggest that if there are differences regarding health, they are more likely to be found in factors not necessarily included in the socio-economic situation.

In the Dunedin study (Simons et al. 1980) it was reported that of children who had been admitted to hospital 25% aged 13 to 36 months were reported to have behavior deterioration. In children aged 36 to 60 months 22% had improved in behavior (eating, sleeping, bowel and bladder control, speech, general behavior, etc.).

EFFECTS OF DAYCARE

A great number of studies have investigated the emotional effects of daycare on children (Rutter 1981). Rutter concluded that there is no evidence that daycare is likely to result in serious emotional disturbance. He suggested that other factors than the daycare per se might be important. It is, for instance, not good if both parents are forced to work outside home when one would rather stay at home and care for the children. It should be possible to choose whether to stay at home or not. There should also be a possibility for part-time work, thus giving parents sufficient time to be with their children. Rutter states that children vary in their response to daycare, not only according to their age but also in terms of temperament. The type and quality of daycare is important, especially for young children from disadvantaged homes. Individual differences in children need to be taken into account when deciding which arrangement is the best (Rutter 1981).

Studies which have investigated combinations of separation, e.g. daycare and hospitalization have not been found.

PRESENT INVESTIGATION

AIMS

The aims of the investigation were:

- o to describe to what extent parents of hospitalized Swedish infants under six months of age participate in the care of their infants during the hospital stay.
- o to study the effects of separation on the mother-infant dyad using the variable of breast feeding. I, II.
- o to study the mothers' experiences of being separated from their infants versus being involved in the care, I, II, III.
- o to compare mothers in terms of success in breast feeding and satisfaction with care related to different hospital routines, I, II, III.
- o to compare the correlation of behavior between caregivers and infants, IV.
- o to investigate long term effects in four-year-old children who have experienced different types of early separation, such as hospitalization and/or daycare, V.

SURVEY I AND II

Parents' participation in the care of hospitalized infants under six months of age in Sweden.

In order to find out to what extent parents of hospitalized infants under six months of age participate in the care of their infants during the hospital stay, two surveys were performed. In January 1982 (Survey I) letters were sent to the chief pediatrician in all Swedish hospitals where sick infants are cared for. Included with the letter was a questionnaire asking about the wards' facilities to keep parents of sick infants in the hospital over night. Information was requested about all infants under six months of age who were staying in the hospitals on a specific date (January 27, 1982) and who had been admitted from home. The survey was repeated 22 months later (Survey II) asking about infants staying in the hospitals on November 15, 1983).

Letters were sent to 43 pediatric hospitals and answers were received from 93% and 86% of the hospitals respectively in the two surveys. Most wards (95%) reported that they could provide for parents to stay over night, either on the ward or close to it. On the days in question 109 infants (Survey I) and 117 infants (Survey II) were treated on the wards participating in the surveys. The numbers of parents staying over night in the hospitals and the frequency of breast feeding are shown in table 1.

The number of parents staying with formula-fed infants increased 25% between the surveys while the number of parents staying with breast-fed infants remained high in both surveys.

As shown in table 2, breast feeding is an important reason for mothers to stay in the hospital over night when their infants are ill. These surveys conclude that in Sweden in 1982-1983 most hospitalized infants under six months of age were not breast-fed. The majority of infants were staying in the hospitals without their parents and were thus handled by a great number of different caregivers.

Table 1. Number of parents staying in the hospital with infants under six months of age

Number of hospitalized infants		Parents staying		Infants entirely breast fed	
Survey		I	II	I	II
<3 months	n=59	n=68	19 (32%)	36 (53%)	17 (29%) 27 (40%)
>3 months	n=50	n=49	19 (38%)	27 (55%)	7 (14%) 10 (20%)

17

Table 2. Number of parents staying in the hospital related to type of feeding

Number of infants under six months of age		Parents staying	
Survey		I	II
Breast fed	24	37	29 (92%) 32 (86%)
Formula fed	85	80	17 (20%) 35 (44%)

Survey I performed Jan 1982
Survey II performed Nov 1983

STUDY I-V

Infants and children

Study I: All full-term infants who were born in the hospitals of Malmö and Helsingborg during a four-month period in 1982 and who were separated for one to six days during the first week of life were selected for the study (n=30). The causes for the separations were minor health problems, e.g. hyperbilirubinemia, respiratory distress, asphyxia, suspected infection and general observation.

Controls were full-term, healthy newborns selected from a birth register. For each separated infant four control infants, born on the same day and at the same hospital as the separated ones, were chosen (n=120).

Study II: Infants, gestational age 37-41 weeks, born in the hospital in Helsingborg during a 15-month period in 1983 and 1984 who developed hyperbilirubinemia (n=29) were selected for the study.

Controls were full-term, healthy infants born in the same hospital during the same period of time (n=60). They were selected as follows: One of the investigators (G.E.) visited the maternity unit about once a month when no jaundiced infants were being treated. On that day, all mothers who were going to be discharged the following day were asked to participate as controls.

Study III: All full-term infants diagnosed as having unstable or dislocated hips (n=30) and born during a 4-month period in 1983 in the hospitals of Malmö and Helsingborg participated in the study. The infants were treated in the von Rosen splint for 6-12 weeks.

Controls were selected in the same way as in Study I (n=120).

Study IV: Fourteen full-term infants under six months of age and eight preterm infants (gestational age at the investigation 37 weeks or more) were selected from five wards in three hospitals in

southern Sweden during the summer of 1984. They were fed orally and did not suffer from acute or severe illnesses.

Study V: All four-year-old children who visited 12 health care centers in southern Sweden during a one-year period in 1983 through 1984 participated in the study (n=535). The health care centers were selected to represent one large city, a medium city, two small towns and the countryside.

Methods

Interviews, I, II, III: All interviews were carried out by the same investigator (G.E.). The importance of avoiding a bias effect was kept in mind and attempts were made to remain objective.

Telephone interviews were used, but in Study II additional questions were asked at the home visits which were made to most of the mothers participating in that study.

The parents' answers and statements were written down during the interview by the use of main points. More detailed notes were made immediately after the interview.

Different types of questions were used in the interviews.

1. Structured questions (I, II, III): Parents were asked about demographic and concrete questions e.g. sex, parity, breast feeding, the infant's health, hospital visits etc.
2. Semistructured questions (III): Parents were asked to tell about experiences in different areas, e.g. the care of the baby in the splint, hygiene issues, the visits every week to the orthopedic clinic, clothing problems, etc.
3. Unstructured questions (II): Parents were encouraged to tell about anything that they felt had been important during the hospital stay.

Before the interviews the parents received a letter telling about the study and also about the questions they would be asked.

Observation, IV: The Nursing Child Assessment Feeding Scale (NCAFS, Barnard 1978) was used. The NCAFS consists of 76 items divided into six subscales (see Appendix 1). Four subscales describe the caregivers' behavior:

1. sensitivity to cues
2. response to infant's distress
3. cognitive growth fostering
4. social growth fostering.

Subscales for infants are:

1. clarity of cues
2. responsiveness to caregiver.

The items are scored as present or absent (1 or 0). The total score was processed and analyzed.

Eighteen of the scores which measure interaction (Quillan 1983) were processed separately after the total scores had been assessed. The caregivers (mothers, fathers and nurses) were asked for permission before the feedings. They were told that the observers were interested in infants' behavior at different ages and with different caregivers.

No notes were made during the observation, the forms were filled in immediately afterwards.

Questionnaire, V: In a pilot study the Child Behavior Check List for children aged from four through sixteen was used (Achenbach 1981). Some of the questions, especially those concerning social competence, were not appropriate for our age group. Thus the revised checklist (CBCL) for children aged two through three (Achenbach 1984) was used in the main study (see Appendix 2A).

The CBCL consists of 100 behavior items describing children's behavior. They were graded as 0 (do not agree), 1 (agree) and 2

(strongly agree). When the data was computerized the 0, 1 and 2 were converted to 1, 2 and 3. Independent variables were sex, number of siblings, age of siblings, rooming-in after the delivery, previous daycare and hospitalization.

The CBCL was translated into Swedish by the investigators, who also classified the items into nine behavior groups: somatic symptoms, dependency, reserved-depressive behavior, anxiety, aggressiveness, hyperactive/impulsive behavior, oral tendencies, anal/compulsive behavior and regression (see Appendix 2B).

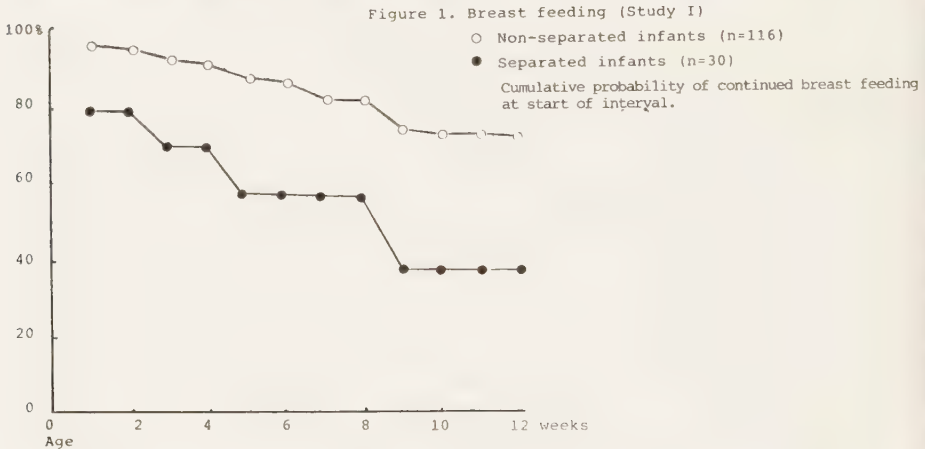
Cortisol in urine, II: Mothers in the non-separated and separated treated groups as well as mothers in the control group were asked to collect urine for 24 hours between days two and seven after the delivery. Mothers whose infants were transferred to the pediatric ward started to collect urine in the morning after the transfer in order to avoid effects from the information concerning the child's condition. The control mothers collected urine during the day before discharge when the risk period for the development of jaundice in the infants had passed. When the collection was completed the urine was carefully stirred and measured. About 10 ml was frozen by the laboratory staff and kept for analysis later. After about three months the mothers were asked to repeat the collection in their homes. On the day of completing the collection, the urine was brought to the hospital and handled in the same way as described above.

The samples were analyzed along with samples from the hospital every second week using the cortisol-125 (Radioimmunoassay Kit, Kit Evaluation, Farnos Diagnostica, Farnos Group LTD, Turku, Finland).

Statistics: The statistical methods used were: Chi-square test (I), Fisher's exact p-test (II), Student's t-test (II, IV, V), Analysis of Variance (IV) and Pearson's correlation (IV) (Armitage 1971, Siegel 1956).

Results

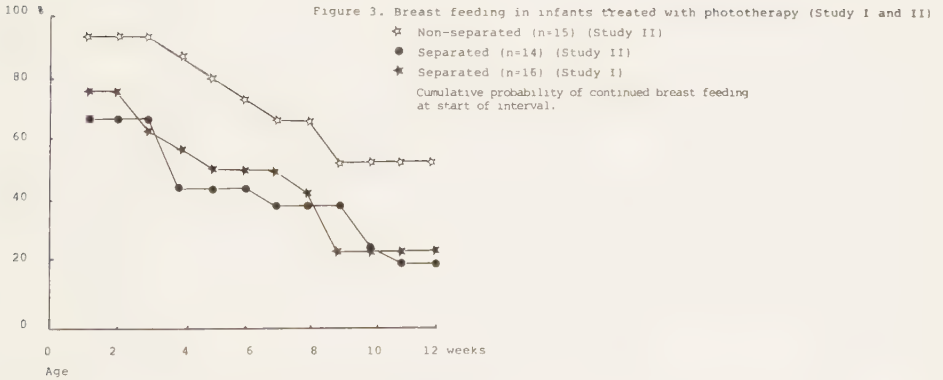
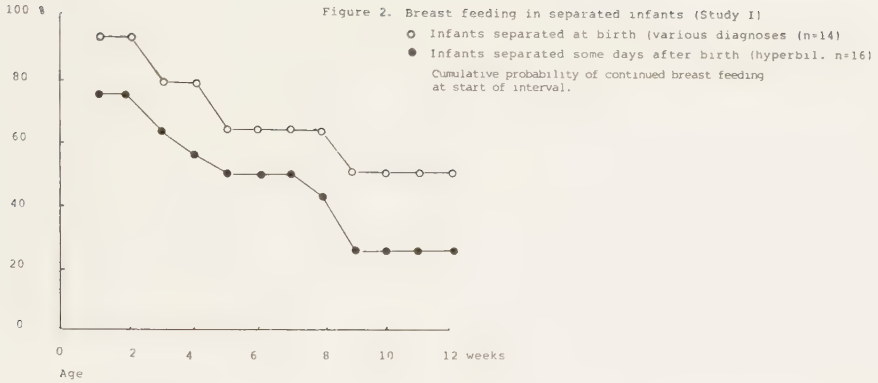
Breast feeding in separated infants with medical problems (I, II):
The duration of breast feeding in study I is shown in figure 1. Thirty-seven percent of the separated infants were entirely breast fed at three months of age versus 72% in the non-separated group.



The separated group included 14 infants who were separated from their mothers immediately after birth and 16 infants who, because of hyperbilirubinemia, were separated two to six days after birth. Some mothers spontaneously said that they would have preferred the separation earlier instead of after they had begun getting acquainted with their babies.

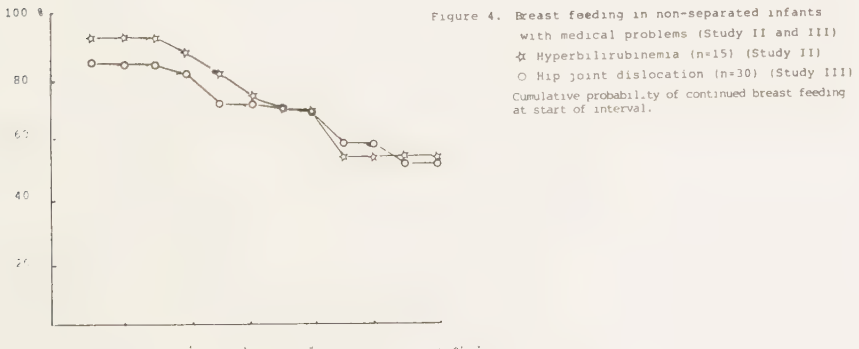
When the infants were divided into two groups according to the time of separation (immediately after birth or a few days after birth), there was a difference, although not statistically significant, in breast feeding between the groups (figure 2).

The persistence of breast feeding in the separated group of hyperbilirubinemia infants in Study I was similar to the separated hyperbilirubinemia group in Study II (figure 3), and different from the non-separated hyperbilirubinemia group in Study II.



Breast feeding in non-separated infants with medical problems

(II, III): When infants with different types of medical problems were compared in non-separated infants (hyperbilirubinemia, II and hip joint dislocation, III), the persistence in breast feeding was similar (figure 4).



This was true in spite of the fact that the infants in one group (II) were cared for by the mothers in the hospital, whereas infants from the other group (III) were cared for at home.

Interview I: The number of primiparous mothers in the separated group was 17 (57%) versus 49 (42%) in the control group. The difference is not statistically significant. In the control group most mothers (90%) were allowed to hold their babies after the delivery for various lengths of time ranging from five minutes to several hours. In the separated group all mothers of infants who later developed jaundice held their babies after the delivery, whereas only three of the mothers whose infants were separated at birth were able to hold their babies.

Although the mothers in this study were asked structured questions, some of them commented on their experiences as follows:

"I was offered a very hard chair while breast feeding, it made my stitches hurt a lot".

"I was allowed to go by taxi to the pediatric ward, but I did not want to bother the staff, therefore I walked, which took about 10 minutes."

"I had to ask for permission to care for my baby and I did not get any help. I had a feeling that I was not wanted."

"I stayed in the same room as three other mothers who had their babies in the room. When their babies cried, my milk leaked. I wished I could have stayed in a single room."

Interview II: The mothers were encouraged to talk about anything that they had experienced as important during the period when their infants were treated on the pediatric ward. In summary, mothers who participated in the care (non-separated) were more satisfied with the situation than the separated ones, although

some of them found the responsibility too great and some missed the companionship with other mothers.

The type of interview used in this study was found to give information that would never had been elicited in a structured interview. One mother stated that she was frightened to move from the pediatric to the maternity ward after the last feeding, shortly before midnight, because the elevator hall was quite empty. She kept thinking about that during the whole day, but was too embarrassed to tell anybody. Several mothers expressed their concern about the eye pads not being properly placed. They worried about the pads even during the night. One mother was deeply upset about the way the heel prick was done to get blood for measuring bilirubin. The baby was asleep and a student technician was allowed to try, requiring several pricks in order to get sufficient blood for the test.

Interview III: There was a difference in the length of treatment in the splint between the two hospitals involved in the investigation which, however, did not influence the duration of breast feeding (Table 3). Mothers from one hospital breast fed for an average of two weeks longer than mothers from the other hospital in the treatment as well as the control group

Table 3. Length of treatment time in the splint and breast feeding

	Length of treatment (weeks)		Breast feeding (weeks)
	Mean	Range	Mean
Hospital I (n=14)	11.4	6-12	9.3
Hospital II (n=16)	8	6-12	7.2

Most mothers found practical problems connected with the care of the infant in the splint. Going to the hospital for the weekly bath at 7.30 a.m., sometimes bringing siblings, was inconvenient to the mothers.

Twenty percent of the mothers were upset when they were told about the diagnosis, and the same number of mothers experienced poor contact with the infants during the treatment time. One mother stated that, compared with an older child, this one was harder to care for and took longer to get to know.

In spite of the trying experience and the hard work keeping the splint clean and protecting the infants from skin irritations, the mothers felt proud of how they managed to solve different problems. They were responsible for the infants' care and they had to make decisions about the best way to handle the situation. This was difficult but it also gave additional self-esteem.

Caregiver-infant interaction IV: Altogether 53 feedings were observed including preterm as well as full-term infants fed by mothers, fathers and nurses.

The questions posed were: Are there behavior differences between parents and nurses as caregivers and are there correlations between the behavior of caregiver and infant.

Total scale (See Appendix 1): Using Analysis of Variance, no difference was found in the NCAFS scores related to sex of infants, hospital, methods of feeding or degree of illness in the infants. The scores were higher in the afternoon feedings than in the morning feedings.

The difference in scores between full term and preterm infants was statistically significant when fed by parents ($p < 0.01$) but not when fed by nurses (Fig. 5). When parents and nurses were compared for all infants the difference disappeared.

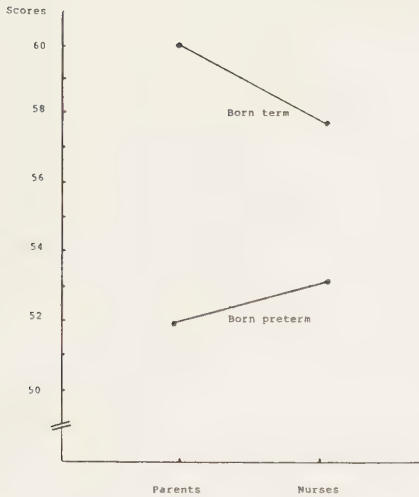


Figure 5. Nursing Child Assessment Feeding Scale (NCAFS) scores of full term and preterm infants fed by parents ($p < 0.01$) and nurses (NS).

The nurse-infant scores were significantly correlated with full-term ($p < 0.01$) as well as preterm ($p < 0.05$) infants on the full scale. This was not the case with parent-infant on the same scale.

Interaction scale (See study IV Append): When the interaction scale was used, the correlation between nurses' and full-term infants' score remained almost the same as in the total scale ($r = 0.84$, $p < 0.001$) whereas the correlation between parents' and infants' score increased ($r = 0.75$, $p < 0.001$).

No correlation was found between the interaction scores of preterm infants and caregivers.

Behavior in children with previous experience of hospital and/or daycare, V: Among the 498 four-year-old children who participated in this study, 40% ($n = 201$) had been admitted to the hospital once or several times, for a total of 231 admissions. Only 15 hospital stays lasted more than two weeks, while 116 lasted for three days or less.

It was found that in the age group older than six months 78% of the children had had their parents staying in the hospital. There was no difference in the behavior related to whether or not the parents had stayed.

In the age group under 6 months 37% of the parents had stayed. This finding is in agreement with the first part of our survey, January 1982, in which 35% of the parents of hospitalized infants under 6 months of age remained in the hospital.

In the group of infants who were hospitalized before six months of age, many of them had had repeated admissions. The group hospitalized just once before six months of age was too small to compare in terms of parent participation in the hospital care.

In the whole group of 498 children, 65% had utilized some sort of daycare and 27% had been to daycare as well as to the hospital.

Children who had been hospitalized ($n=201$) had more hyperactive/impulsive ($p 0.008$) and regressive ($p 0.038$) behavior than non-hospitalized ones. More anxiety behaviors ($p 0.031$) were found in children who had received daycare compared with children who had been cared for at home. However, when children who had received daycare were excluded from the group, no difference was found between hospitalized and non-hospitalized children. Similarly, in non-hospitalized children no difference was found between children who had received daycare and children who had not.

In the group of children who had been to daycare as well as to hospital, a great number of behavior differences were found compared with hospitalized children who had not received daycare: dependency ($p 0.038$), reserved-depressive behavior (0.052), aggressiveness ($p 0.042$), hyperactive-impulsive behavior ($p 0.014$) and regression ($p 0.027$).

DISCUSSION

SEPARATION IN THE NEWBORN PERIOD

Numerous mothers in Sweden (about 10,000 in 1981) are separated from their newborns after delivery because of mild illnesses in the infants which include only a few days of care on a pediatric or intensive care ward. Many of these separations are not due to the condition of the mothers or the infants. The separations might be due to hospital routines, as has been shown in Study II or to inexperienced nurses and physicians (de Chateau 1983) who do not feel capable of taking the responsibility for sick newborns.

The present investigation emphasized that even if the separations were short, the parents, especially the mothers, got upset and the separation negatively affected the duration of breast feeding.

In the three studies regarding breast feeding (I, II, III) we found that infants with minor medical problems (hip joint dislocation and jaundice) who were not separated were as successful in breast feeding as were healthy, non-separated infants, whereas separated infants breast fed for a significantly shorter period. Thus, it seemed that the separation caused the decline in breast feeding, rather than the illness or the mothers' experience of the illness.

It is hard to understand why and how a short separation in which the mother-infant pairs are separated only between the feedings influences the success of breast feeding.

Jaundiced infants are separated at a very sensitive point in time, usually on the 2nd to 4th day after delivery when the milk excretion is getting established. We found that mothers of these jaundiced infants who were separated after some days were less successful in breast feeding than mothers whose infants were transferred immediately after birth, although the difference was not statistically significant. This is in agreement with the mothers' statements that they found it hard to be separated from their infants at the point in time when they were getting to know

their babies. This finding does not support the theory by Kennell et al (1975) that the first 12 hours after birth is the period most sensitive to separation, at least not with regard to breast feeding and the mothers' experience.

Other authors have shown various effects of short separation between mothers and infants after birth. They all support our findings that separation of mothers and their newborns is harmful.

Tamminen et al. (1983) have reported that breast feeding is negatively affected by separation after the delivery. They found, however, that once breast feeding was established the separated mothers were as successful as other mothers. Our studies do not agree with that. Most mothers were entirely breast feeding when they were discharged from the hospital, but they stopped breast feeding earlier than non-separated mothers.

A British study showed that mother-infant separation caused by mild illness and lasting for 2-14 days decreased the interaction between mother and infant at one and two months of age (Whiten 1977).

A scale for parent-infant interaction was developed (Stainton 1981) using five categories of maternal behavior: Sensitivity to infants, touching/holding, eye-to-eye and face-to-face contact, caretaking and competence/expression of feelings. The maximum score for the first five days was 10. Stainton found that if an infant went into an incubator on day three for phototherapy, the mother's score dropped by one or two points. As the treatment time increased, the mother's score decreased. Stainton reported that if the phototherapy took place at the mother's bedside, the mother seemed to relate to the infant with less anxiety.

A group of colicky infants was compared with a non-colic group (Wahlberg 1982). Significantly more colic infants had been separated from their mothers immediately after birth and placed in an incubator.

Leiderman and Seashore (1975) found that mothers who had participated in the infants' care felt more confident of being able to care for them when discharged. This is in agreement with our findings that even if the care had been stressful and trying the mothers were satisfied with having had the experience.

In the "Exeter study" (Jaques et al. 1983), it was found that even in a "normal situation" the mothers felt that the nurses were the primary caregivers and that the mothers had to obtain the nurses' permission before handling the infants. This experience was commonly mentioned by our separated mothers.

It happens too often that nurses in the hospital take over the responsibility and care of the infants instead of helping the mothers care for their own infants. The nurses' efficiency and professional knowledge might decrease the mothers' self-esteem, thus making mothers too willing to give in to rules and routines which they may not really like, or may not be used to.

INFANTS SEPARATED BY HOSPITALIZATION BEFORE SIX MONTHS OF AGE

In the surveys performed in 1982 and 1983 (page 16) it was found that of infants under three months of age who were admitted to the hospital 29% and 40% were breast fed. Of infants aged three to six months, 14% and 20% were breast fed, a low percentage for Sweden. Between the two surveys the number of mothers staying with formula fed infants in the hospital had increased by 25%, whereas the number of breast feeding mothers staying remained about the same.

According to earlier research, infants who are not breast fed are more likely to be hospitalized. Cunningham (1977) and Fallot et al. (1980) reported reduced incidence of hospitalization in breast fed infants compared with formula fed ones. Breast fed infants are less likely to develop respiratory and gastrointestinal infections (Gerrard 1974, Pullan et al. 1980), and prolonged breast feeding has been reported to be a prophylaxis for atopic disease (Saarinen 1979) and otitis media (Saarinen 1982).

We do not know whether the causes for admissions in the present surveys were due to factors associated with the infants not being breast fed, or if the mothers who were not breast feeding were more likely to accept hospitalization for their infants. However, mothers who were not breast feeding were less likely to stay in the hospital over night. This situation could be dependent on the staff's attitude to the mothers' staying. When an infant of this age is admitted to hospital, the mother is asked if she is breast feeding. If she is, it is more or less understood that she is going to stay with the infant. If she is not breast feeding, she may have to ask for permission to stay, or she might not find it important to stay. Jaques (1983) reported that mothers who did not have an identifiable role when caring for their infant in the hospital felt bored and not needed. The mothers also indicated that they felt that the staff seemed to care for their infants adequately and possessed all the skill that the mothers felt they lacked. Thus it is important to inform mothers about the value of their staying with their infants when they are hospitalized.

If the mother does not stay with her infant in the hospital, the infant will be taken care of by a large number of nurses. According to our results (IV), this means the style of handling and treatment will vary several times a day in the same infant. One mother in the "Exeter study" stated: "I wonder how differences in handling will affect her? With one person you have a bit of continuity in handling, but there are different nurses and I should think different ways of handling and I wonder if she notices and how she feels about it?"

Nurses are different and their behavior varies with different infants. Some nurses, for instance, pay more attention to the surroundings than to the infant they are feeding, whereas other nurses stimulate the infant throughout the feeding. These varying behaviors of nurses were found to influence the infants' behavior (IV) as shown by significant correlations between the infants' and the caregivers' feeding scores.

The nurses also influence the mothers' behavior. One mother in our study who usually had a score between 45 and 48 was once, before a

feeding, told that she had to feed her baby "better" before he could be discharged. That mother's score dropped to 36 at that feeding.

Parent-infant interaction scores were more highly correlated than the full scale scores. This was not the case with nurses. The total scale measures interaction items as well as practical issues which are new for many parents' but not for nurses. We found, for instance, that nurses were more able to cope with infants' distress during feedings than were parents. Interaction, however, might be independent of earlier education and training, which would explain the parents' higher interaction scores. The scores as well as the observed behavior in mothers and nurses as caregivers confirm that nurses are more secure and familiar with the hospital situation and routines than are parents.

SEPARATION THROUGH HOSPITALIZATION AND DAYCARE

There are different opinions whether hospitalization in early childhood has long-term effects or not (Zetterström 1984). The effects of hospitalization per se are not possible to estimate since they are dependent on variables such as the security of children and parents and the circumstances surrounding the hospitalization. That might explain the various results of research on this topic.

Certain conditions are similar for children in the hospital and daycare, e.g. a temporary separation from the parents, a new environment and exposure to several new adults. Thus we compared (V) children who had experienced hospitalization as well as daycare with children who had been to daycare but not to hospital and vice versa. The study showed that more hyperactive/impulsive and regressive behavior was found in children who had been hospitalized and more anxiety behaviors were found in children who had been utilizing daycare.

When non-hospitalized children were compared, no behavior difference was found related to daycare. Likewise, children who had not received daycare did not vary in behavior whether or not

they had been hospitalized. The most striking difference was found in the group of children who had utilized daycare. When they were compared with regard to hospitalization, hospitalized children showed significantly more dependent, aggressive, hyperactive/impulsive and regressive behavior than children who had not been hospitalized.

A superficial conclusion from these results could be that children who have attended daycare are more vulnerable to additional stressful events and thus react more intensely than children not attending daycare. However, we do not know the initial startpoint for the children. Roopnarine and Lamb (1979) tested 3-year-old children before the enrollment in daycare and 3 months after beginning daycare using "the strange situation" (Ainsworth and Wittig 1969). The children were compared with a similar group who had been cared for at home. Their findings suggest that the daycare children were already more anxious and insecure when they were tested one week before the onset of daycare.

About 35% of the children participating in the present study did not attend daycare. An important question is whether these children constitute a special group thus explaining the results. In Sweden today it is hard for a family to exist on one salary, even if the salary is pretty high. The parents staying at home are discriminated against through decreased social advantages such as sick payments and points for pension insurance. Taking care of your own child at home does not provide any credits. It is therefore reasonable to assume that parents who do stay at home despite the financial disadvantages find it important. They may prefer to do so and probably believe it to be advantageous for the children. Many parents, especially single parents, do not have a choice. Thus it is important to keep in mind that emotional and/or psychosocial factors other than the hospitalization/daycare experience might have produced the behavior differences in this study.

GENERAL CONCLUSION AND SUMMARY

These studies investigated the effects of separation of mothers and their newborns with regard to the mothers' experiences and their success in breast feeding.

The infants' abilities to respond differently with caregivers during hospitalization was investigated and caregivers' behavior was scored by using a special scale.

Long term effects of hospitalization and/or daycare were analyzed by using a child behavior checklist.

The results suggest: 1. Mothers should not be separated from their newborns unless absolutely necessary, e.g. because of the condition of the mother or the infant. A separation is traumatic for the mother-infant and results in a decrease in breast feeding.

2. If the baby has to have special treatment, it is important that the parents (usually the mothers) get involved and are given as much responsibility as possible for the infant's care. This is also true for infants who are hospitalized after the newborn period. The parents must not only be allowed to stay with their infants, they should be supported and encouraged to care for their infants during hospitalization. This is important not only for the mother's self-esteem but for the baby's welfare.

3. The infants are capable of recognizing different caregivers, a fact which emphasizes the importance of the main provider of care continuing as the caregiver when infants are hospitalized.

4. The behavior of children at the age of four who had been hospitalized was different from that of children who had not experienced hospitalization. This was true only if the hospitalized children had been utilizing daycare outside their home.

ACKNOWLEDGEMENTS

Gunilla Barkenius
Kathryn Barnard
James Bergseng
Ingrid Holmstedt
Tor Lindberg
Alf Nilsson
Betty Jean Pannabecker
Niels Räihä

Thank you.

I am most grateful for the cooperative participation of the staffs at the paediatric units in Malmö, Helsingborg and Lund and the maternity unit in Helsingborg as well as the nurses at the health care centers involved.

The Parents' enthusiasm and cooperation in the different studies is highly appreciated.

The investigation was supported by Malmö County Council; Medical Faculty, University of Lund; Save the Children Foundation, Sweden; Barnets Lyckopenning; Föreningen Mjölkdroppen, Helsingborg and Fredrika Bremer Förbundet.

REFERENCES

Achenbach TM, Edelbrock CS:

Behavioral problems and competencies reported by parents of normal and disturbed children aged four through sixteen. Monographs of the Society for Research in Child Development no 46, 1981.

Achenbach TM:

Child behavior check list for ages 2-3. Burlington, Vermont: Department of Psychiatry, University of Vermont 1984.

Ainsworth MD:

Patterns of attachment behavior shown by the infant in interaction with his mother. Merrill-Palmer Q 10:51, 1964.

Ainsworth MD, Wittig BA:

Attachment and exploratory behavior of one-year-olds in a strange situation. In Foss BM (Ed): Determinants of infant behavior IV, London: Methuen 1969.

Armitage P:

Statistical methods in medical research. Second edition, Blackwell Scientific Publication, Oxford & Edinburgh 1971.

Bakwin H:

Loneliness in infants. Am J Dis Child 63:30, 1942.

Bakwin H:

Psychogenic fever in infants. Am J Dis Child 67:176, 1944.

Bakwin H:

Psychologic aspects of pediatrics: Emotional deprivation in infants. J Pediatrics 35:512, 1949.

Barnard KE:

NCAST Nursing Child Assessment Feeding Scales. Seattle: University of Washington 1978.

Barnard KE, Bee HL:

The assessment of parent-infant interaction by observation of feeding and teaching. In Brazelton TB & Als H (Eds). New approaches to developmental screening of infants. New York: Elsevier North Holland Inc 1984.

Benjamin JD:

Further comments on some developmental aspects of anxiety. In Gaskin HS (Ed), Counterpoint International Universities Press, New York 1963.

Bloom K, Goldbloom RB, Robinson SC, Stevens FE:

Factors affecting the continuance of breast feeding. Acta Paediatr Scand Suppl 300, 1982.

Bowlby J:

Attachment and Loss Vol. 1. Hogarth Press, London 1969.

Brazelton TB, Koslowski B, Main M:

The origins of reciprocity: The early mother-infant interaction. In Lewis M and Rosenblum LH (Eds). The effect of the infant on its caregiver. New York: John Wiley and Sons 1974.

Brazelton TB, Tronick E, Adamson L, Als H, Wise S:

Early mother-infant reciprocity. In Ciba Foundation Symposium, Parent-Infant Interaction. New York: American Elsevier 1975.

Brenneman J:

The infant ward. Am J Dis Child 43:577, 1932.

Burns P, Sander LW, Stechler G, Julia H:

Distress in feeding: Short-term effects of caretaker environment of the first 10 days. J Am Acad Child Psychiatry 3:427, 1972.

Chapin HD:

A plan of dealing with atrophic infants and children. Arch Pediatr 25:491, 1908.

Chapin HD:

Are institutions for infants necessary. JAMA 64:1, 1915a.

Chapin HD:

A plea for accurate statistics in infants' institutions.

Transactions of the American Pediatric Society 27:180, 1915b.

Chapple CC:

A cabinet cubicle for infants combining isolation with control of temperature and humidity. J Pediatr 16:215, 1940.

De Chateau P, Holmberg H, Jakobsson K, Winberg J:

Lactation promoting and inhibiting factors in neonatal care.

Dissertation, Umeå University no 20, 1976.

De Chateau P:

The importance of the neonatal period for the development of synchrony in the mother-infant dyad - A review. Birth and the Family Journal 4:10, 1977.

De Chateau P:

Stockholm, Sweden: The small baby not requiring intensive care. In Davis JA, Richards MPM and Robertson NRC (Eds). Parent-Baby Attachment in premature infants. Croom Helm London and Canberra, St. Martin's Press, New York 1983.

Condon WS, Sander LW:

Synchrony demonstrated between movements of the neonate and adult speech. Child Dev 45:456, 1974.

Cunningham AS:

Morbidity in breast-fed and artificially fed infants. J Pediatr 90:726, 1977.

Douglas JWB:

Early hospital admissions and later disturbances of behaviour and learning. Dev Med Child Neurol 17:456, 1975.

Fallot ME, Boyd III JL, Oski FA:

Breast feeding reduces incidence of hospital admissions for infections in infants. *Pediatrics* 65:1121, 1980.

Gerrard JW:

Breast feeding: Second thoughts. *Pediatrics* 54:757, 1974.

Hwang CP, Lamb ME:

Maternal attachment and mother-neonate bonding: A critical review. In Lamb ME and Brown AL (Eds): *Advances in Developmental Psychology* (vol 2) Hillsdale NJ: Lawrence Erlbaum Associates, 1982.

Jaques N, Hawthorne Amick J, Richards M:

Parents and the support they need. In Davis JA, Richards MPM and Robertson NRC (Eds): *Parent-baby attachment in premature infants*. Croom Helm London and Canberra St. Martin's Press, New York 1983.

Kennell JH, Trause MA, Klaus MH:

Evidence for a sensitive period in the human mother. In *Parent-Infant Interaction*. Ciba Foundation Symposium no. 33:87, Amsterdam: Elsevier 1975.

Klaus MH, Jerauld R, Kreger NC, McAlpine W, Steffa M, Kennell JH: Maternal attachment: Importance of the first post-partum days. *N Engl J Med* 286:460, 1972.

Leiderman PH, Seashore MJ:

Mother-infant neonatal separation: Some delayed consequences. In *Parent-Infant Interaction*, Ciba Foundation Symposium no 33, Amsterdam Elsevier, 1975.

Lowrey LG:

Personality distortion in early institutional care. *Am J Orthopsychiat* 10:576, 1940.

Pullan CR, Toms GL, Martin AJ, Gardner PS, Webb JK, Appleton DR:

Breast-feeding and respiratory syncytial virus infection. *Br Med J* 281:1034, 1980.

Quillan SI:

Growth and development of infant and mother and mother-infant synchrony. Dissertation Wayne State University Detroit, Michigan 1983.

Quinton D and Rutter M:

Early hospital admissions and later disturbances of behaviour. An attempted replication of Douglas' findings. *Dev Med Child Neurol* 18:447, 1976.

Roopnarine J, Lamb M:

The effects of daycare on attachment and exploratory behavior in a strange situation. *Merril-Palmer Q* 24:85, 1979.

Rutter M:

Social-emotional consequences of daycare for preschool children. *Am J Orthopsychiat* 51:4, 1981.

Saarinen UM, Kajosaari M, Bakman A, Siimes MA:

Prolonged breast feeding as prophylaxis for atopic disease. *Lancet* 11:163, 1979.

Saarinen UM:

Prolonged breast feeding as prophylaxis for recurrent otitis media. *Acta Paediatr Scand* 71:576, 1982.

Sander LW, Stechler G, Burns P, Julia H:

Early mother-infant interaction and 24-hour patterns of activity and sleep. *J Am Acad Child Psychiatry* 9:103, 1970.

Schaffer HR:

Objective observations of personality development in early infancy. *Br J Med Psychol* 31:174, 1958.

Schaffer HR, Callender WM:

Psychologic effects of hospitalization in infancy. *Pediatrics* 24:528, 1959.

Siegel S:

Non-parametric statistics for behavioral sciences. McGraw Hill, New York 1956.

Simons B, Bradshaw J, Silva PA:

Hospital admissions during the first five years of life: A report from the Dunedin Multidisciplinary Child Development study. N Z Med J 91:144, 1980.

Sosa R, Kennell JH, Klaus M, Urrutia JJ:

The effect of early mother-infant contact on breast feeding, infection and growth. In Breast Feeding and the Mother. Ciba Foundation Symposium no. 45, Amsterdam, Elsevier 1976.

Spitz RA:

Anxiety in infancy: A study of its manifestations in the first year of life. Int J Psychoanal 31:138, 1950.

Stainton MC:

Parent-infant interaction: Putting theory into nursing practice. The University of Calgary, Faculty of Nursing Calgary, Alberta 1981.

Sundelin C, Vuille JC:

Socio-economic status of the family and health problems in the preschool child. Lack of correlation in a Swedish sample. Acta Paediatr Scand Suppl 275, 59, 1979.

Tamminen T, Verronen P, Saarikoski S, Göransson A, Tuomiranta H:

The influence of perinatal factors on breast feeding. Acta Paediatr Scand 72:9, 1983.

Taylor PM, Taylor FH, Maloni JA, Campbell SB, Cannon M:

Effects of extra early mother-infant contact. Acta Paediatr Scand Suppl 316, 1985.

Tennes KH, Lampl EE:

Stranger and separation anxiety in infancy. J Nerv Ment Dis 247, 1964.

Wahlberg V:

Reconsideration of Crede prophylaxis. A study of maternity and neonatal care. Dissertation. Acta Paediatr Scand Suppl 295, 1982.

Whiten A:

Assessing the effects of perinatal events on the success of the mother-infant relationship. In Schaffer HR (Ed): Studies in mother-infant interaction. Academic Press, New York 1977.

Yarrow LJ, Pedersen FA:

Attachments: Its origins and course. In the Young Child: Reviews of Research, vol II, National Association for the Education of Young Children, 1972.

Zetterström R:

Responses of children to hospitalization. Review article. Acta Paediatr Scand 73:289, 1984.



Short Mother-Infant Separation during First Week of Life Influences the Duration of Breastfeeding

G. ELANDER and T. LINDBERG

From the Departments of Paediatrics, Central Hospital, Helsingborg and General Hospital, Malmö, University of Lund, Sweden

ABSTRACT. Elander, G. and Lindberg, T. (Departments of Paediatrics, Central Hospital, Helsingborg and General Hospital, Malmö, University of Lund, Sweden). Short mother-infant separation during first week of life influences the duration of breastfeeding. *Acta Paediatr Scand* 73: 237, 1984.

Thirty term infants, who were separated 1-6 days (mean 3.3 days) from their mothers during the first week of life because of minor illnesses, were compared with 116 term non-separated infants with regard to breastfeeding. At 3 months of age the frequency of entirely breastfed infants was 37 % in the separated group versus 72 % in the non-separated group, $p < 0.001$. Thus a few days of separation between mothers and infants during the first week of life seems to decrease the duration of breastfeeding. *Key words: Breastfeeding, short separation, neonatal period.*

Research during the last decade (1) has stressed that early and close contact between mothers and their newborns might be of importance at later maternal and infant behaviour and the bonding. Some authors (2, 3) have suggested that additional contact to routine care post partum would increase the success of breastfeeding. These findings raise the question whether a short separation, caused by illness during the first week of life, would influence the duration of breastfeeding. The aim of this study was to elucidate this question. The results show, that even a few days of separation between mother and infant shortly after birth, affects the mother's ability to breastfeed her baby.

PATIENTS AND METHODS

Separated group. All full-term infants, who were born during the periods from March to June and August to September 1982 in the cities of Malmö and Helsingborg, South Sweden, and separated from their mothers for 1-6 days (mean separation 3.3 days) were included in this study ($n=30$). The infants were cared for in 2 pediatric wards in 2 different hospitals.

Sixteen infants suffered from hyperbilirubinemia with a mean peak bilirubin level of 339 $\mu\text{mol/l}$ (205-428 $\mu\text{mol/l}$) and received phototherapy. They were separated from their mothers between the 2nd and 6th day after birth after having been cared for by their mothers (modified rooming-in system). The mothers took care of and fed their infants on schedule during daytime, but returned to the maternity ward between the feedings.

Fourteen infants were separated immediately after birth because of acute yet mild illness e.g. respiratory distress, asphyxia, suspected infection and also for general observation. If possible, they were fed and taken care of by their mothers. After 2-3 days they were brought back to the maternity ward. All mothers, but one, were breastfeeding when discharged from the hospital.

Non-separated group. For each infant, 4 non-separated healthy full-term infants were selected from a register ($n=120$). They were born in the same hospital as the separated infants and on the same day or close to it. Three mothers in this group could not be reached by telephone or letters. One mother refused to participate in the study. The group thus consisted of 116 non-separated infants. During the periods of investigation 115 infants were born in the two hospitals.

In Sweden women usually remain in hospital 5-7 days after delivery. A modified rooming-in system is used, which means that mothers and infants stay together in the same room during daytime. At night the infants are taken to the nursery. When the infants were about 3 months of age, a letter was sent to their mothers. Before then, they did not know about the study. The letter gave information about the study, but the aim was not obvious as question about breastfeeding was just one of several

questions. The letter also told about the subject matter on which questions would be put to them on a telephone interview some days later by one of us (G. E.). The interview included 16 questions e.g. circumstances after delivery, the infant's health, sleep habits and the type of feeding etc. The interviews lasted between 10 and 30 min depending on the mother's need of talking.

Statistics. *p*-Value was calculated by using χ^2 . On one occasion the expected number was less than 5, why Yate's correction was done as well.

RESULTS

Table 1 shows significantly shorter duration of breastfeeding in the separated group, where 37% versus 72% of the infants in the non-separated group were entirely breastfed at 3 months of age. The infants suffering from hyperbilirubinemia had a shorter duration of breastfeeding than those, who were suffering from other minor illnesses, but the difference was not significant. Primi- and multiparous were compared in terms of breastfeeding, but no difference was found. There was no difference connected with sex, nor if the infants were fed on schedule or demand or if the newborns were given to the mothers immediately after birth or not.

DISCUSSION

During the last 10 years, there has been an increase of breastfeeding in Sweden because of intensive information. During this decade reports (2–10) have been published, which have claimed that extended contact between mother and infant after birth has a beneficial long term effect on breastfeeding and on the mother's behaviour. However, some recent reports do not agree with this conception (11–15) and the matter has recently been brought up to discussion (16–17).

Surprisingly the effect of a short mother–infant separation after birth on e.g. the success of breastfeeding has attained little attention. Tamminen et al. (18) found that infants born by caesarean section or assisted delivery, infants with low birth weight or asphyxiated at birth, did not start breastfeeding as often as did normally delivered and healthy infants. However, once it was started, the duration of breastfeeding was not found to be affected by these factors.

The results of our study emphasize that even a mild illness in full-term newborns causing a short period of separation between mother and infant at the beginning of life, can decrease the duration of breastfeeding, although the infants continue to be breastfed during the separated period.

Probably the low frequency of breastfeeding in our separated group was caused by a mixture of variables, e.g. effect on the infant by the illness per se, effect on the mother by anxiety for the infant, and lack of satisfying social support to the mother when required.

Table 1. Duration of breastfeeding in separated and non-separated group of infants

Group of infants	Number of infants breastfed at ^a		
	1 month	2 months	3 months
Separated (<i>n</i> =30)	21 (70%)	17 (57%)	11 (37%)
Non-separated (<i>n</i> =116)	106 (91%)	96 (83%)	84 (72%)
	<i>p</i> <0.01	<i>p</i> <0.01	<i>p</i> <0.001

^a About 75% of the infants in Helsingborg and Malmö were breastfed at 2 months, and 50% at 4 months in 1980.

The sixteen infants with hyperbilirubinemia received the same routine contact with their mothers during the first 2–3 days as the control infants and, moreover, they continued to be breastfed during the phototherapy period. Yet, these infants had as short duration of breastfeeding as those who were separated from their mothers immediately after birth.

Telzrow et al. (19) have, using Brazelton's score (20), measured the behaviour of jaundiced infants who had received phototherapy. He found a lower score amongst items, which assessed the infant's capacity and behaviour in adult–infant interaction. However, he did not find any correlation between the level of jaundice and the infant's behaviour. Similarly to that, we did not find any correlation between the duration of breastfeeding and the level of jaundice.

Phototherapy in itself can influence the infant in different ways through loss of visual, verbal and tactile stimulation. We do not know what impact a newborn in an incubator, perhaps blindfolded, may have on a mother in the very sensitive period after delivery. Further studies on the influence of hyperbilirubinemia and phototherapy on the mother–infant interaction are in progress.

REFERENCES

1. de Chateau P. The importance of the neonatal period for the development of synchrony in the mother–infant dyad—a review. *Birth Fam J* 1977; 4: 12–22.
2. Sosa R, Kennell JH, Klaus MH, Urrutia JJ. The effect of early mother–infant contact on breastfeeding, infection and growth. In: Elliott K, Fitzsimons DW, eds. *Ciba Foundation Symposium 45* (New series). Amsterdam: Elsevier, 1976: 179–193.
3. de Chateau P, Holmberg H, Jacobsson K, Winberg J. A study of factors promoting and inhibiting lactation. *Dev Med Child Neurol* 1977; 19: 575–84.
4. Klaus MH, Jerauld R, Kreger NC, McAlpine W, Steffa M, Kennell JH. Maternal attachment. Importance of the first post-partum days. *N Engl J Med* 1972; 286: 460–63.
5. Hwang CP. Aspects of the mother–infant relationship during nursing, 1 and 6 weeks after early extended post-partum contact. In: Dobbing J., ed. *Early human development*. Amsterdam: Elsevier/North-Holland Biomedical Press, 1981: 279–87.
6. Ringler N, Trause MA, Klaus MH, Kennell JH. The effects of extra post-partum contact and maternal speech patterns on children's IQs, speech and language comprehension at five. *Child Dev* 1978; 49: 862–65.
7. de Chateau P, Wiberg B. Long-term effect on mother–infant behaviour of extra contact during the first hour post partum. I. First observation at 36 hours. *Acta Paediatr Scand* 1977; 66: 137–43.
8. de Chateau P, Wiberg B. Long-term effect on mother–infant behaviour of extra contact during the first hour post partum. II. A follow-up at three months. *Acta Paediatr Scand* 1977; 66: 145–51.
9. Kennell JH, Jerauld R, Wolfe H et al. Maternal behaviour one year after early and extended post-partum contact. *Dev Med Child Neurol* 1974; 16: 172–79.
10. Ringler NM, Kennell JH, Jarvella R, Navojosky BJ, Klaus MH. Mother-to-child speech at 2 years—effect of early postnatal contact. *J Pediatr* 1975; 86: 141–44.
11. Svejda MJ, Campos JJ, Emde RN. Mother–infant "Bonding": Failure to generalize. *Child Dev* 1980; 51: 775–79.
12. Schaller J, Carlsson S, Larsson K. Effect of extended post-partum mother–child contact on the mother's behaviour during nursing. *Infant Behav Dev* 1979; 2: 319–24.
13. Carlsson S, Fagerberg H, Horneman G et al. Effects of various amounts of contact between mother and the child on the mother's nursing behaviour. A follow-up study. *Infant Behav Dev* 1979; 2: 209–14.
14. Svejda MJ, Pannabecker BJ, Emde RN. Parent-to-infant attachment. A critique of the early "Bonding" model. In: Emde RN and Harmon RJ, eds. *The development of attachment and affiliative system*. New York: Plenum Press, 1982.
15. Lamb M. Early contact and maternal–infant bonding: One decade later. *Pediatrics* 1982; 70: 763–68.
16. Lamb M. The bonding phenomenon: Misinterpretations and their implications. *J Pediatr* 1982; 101: 555–57.
17. Klaus MH, Kennell JH. Parent to infant bonding: Setting the record straight. *J Pediatr* 1983; 102: 575–76.

18. Tamminen T, Verroneri P, Saarikoski S, Göransson A, Tuomiranta H. The influence of perinatal factors on breastfeeding. *Acta Paediatr Scand* 1983; 72: 9-12.
19. Telzrow RW, Snyder DM, Tronick E, Als H, Brazelton TB. The behaviour of jaundiced infants undergoing phototherapy. *Dev Med Child Neurol* 1980; 22: 317-26.
20. Brazelton TB. Neonatal Behaviour Assessment Scale. *Clinics in Developmental Medicine* no. 50. London: S.I.M.P. with Heinemann Medical; Philadelphia: Lippincott, 1973.

Submitted June 9, 1983. Accepted Sept. 15, 1983

(G. E.) Department of Paediatrics
Central Hospital
S-251 87 Helsingborg
Sweden

Hospital Routines in Infants with Hyperbilirubinemia Influence the Duration of Breast Feeding

G. ELANDER and T. LINDBERG

From the Department of Paediatrics, Central Hospital, Helsingborg, Sweden

ABSTRACT. Elander, G. and Lindberg, T. (Department of Paediatrics, Central Hospital, Helsingborg, Sweden). Hospital routines in infants with hyperbilirubinemia influence the duration of breast feeding. *Acta Paediatr Scand*, 75: 708, 1986.

Twenty-nine infants undergoing phototherapy to treat hyperbilirubinemia were divided into two groups. One group of mothers (non-separated) were transferred with their infants to the paediatric ward and remained as the primary care provider. The other group of mothers (separated) remained on the maternity ward and went to the paediatric unit to care for their infants at feeding times. A third group of healthy mothers and infants served as controls. Mothers in the non-separated group were more satisfied with the care than mothers in the separated group. The duration of breast feeding in the separated group was significantly shorter than in the other groups. The urine cortisol levels in the separated mothers were the same at one week and three months after delivery. The mothers in the other two groups had significantly higher urine cortisol levels during the first week postpartum than three months postpartum. We conclude that routine phototherapy for jaundiced infants should not separate mothers and infants. **Key words:** hyperbilirubinemia, care routines, breast feeding, urine cortisol.

Several authors have reported changes in the mother-infant relationship when newborn infants have been separated from their mothers, even if the separations were due to only minor health problems. Whiten (1) compared a group of healthy infants with another group of infants who had medical problems but were not in need of special treatment. He found significant differences between the separated group and the control group in the interaction between mothers and infants at one and two months of age.

Tamminen et al. (2) found that infants born by Caesarean section or assisted delivery, infants with low birth weight, and asphyxiated infants were breast fed less often than were healthy, normally delivered infants.

Elander & Lindberg (3) reported that full-term infants who were separated from their mothers due to minor illnesses were breast fed for a significantly shorter period than were non-separated, healthy controls. In that study there were several possible variables which might have influenced the infants or the mothers, and thus the breast feeding. About 50% of these separated infants suffered from hyperbilirubinemia and received phototherapy. It could be questioned whether the duration of breast feeding was influenced by the jaundice or the treatment itself. To investigate this question the present study was conducted. The duration of breast feeding and the mothers' experience of the care were compared in two groups of jaundiced infants, whose care routines were different. In one group the mothers remained as the main provider of care, and thus were not separated from their infants, whereas in the other group the standard routines were followed.

By using a biochemical parameter (cortisol in urine) an attempt was made to verify the stress that mothers might experience through being separated from their newborn infants.

PATIENTS AND METHODS

The investigation was carried out during a 15-month period in 1983 and 1984. During this period, healthy infants with gestational ages between 37 and 41 weeks who developed hyperbilirubinemia were included

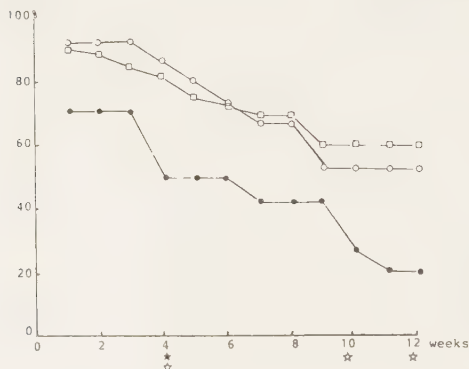


Fig. 1. Breast feeding in non-separated (○, $n=15$), separated (●, $n=14$) and control (□, $n=55$) groups. Cumulative probability (p) of continued breast feeding at start of interval. ★ $p<0.05$ between ○ and ● groups (2-tailed), ☆ $p<0.05$ between □ and ● groups (2-tailed).

in the study ($n=29$). The need for phototherapy to treat hyperbilirubinemia was determined by the neonatologist in charge. Usually the criterion for treatment was S-bilirubin $\geq 350 \mu\text{mol/l}$, but occasionally other criteria were used. All jaundiced infants were transferred to the same paediatric ward, cared for in the same way in an incubator, and received phototherapy. The infants were selected alternately from the two maternity wards, independent of the investigators' knowledge or influence. Occasionally the lack of an empty single room determined to which group the infant was assigned. The staff on the wards did not know the purpose of the study.

Separated group. The infants in this group were cared for according to standard routines. They were transferred to the paediatric ward while the mothers remained in the maternity ward but were free to visit and care for their infants.

Non-separated group. These mothers stayed in a single room with their infants. They were taught by one of the investigators (G. E.) how to care for their infant, and they were free to take as much responsibility as they wished for the infant's care. The instructions lasted for 1–2 hours and were usually given in the presence of the nurse, who was responsible for the infant. The mothers were briefly visited once a day by G. E. until discharged.

Control group. Fifty-five healthy mother–infant pairs served as controls, selected as follows: During the study period G. E. visited the maternity unit about once a month, when no jaundiced infants were treated. On that day, all mothers, who were going to be discharged the next day, were asked to participate as controls. They were cared for using a modified rooming-in system.

Urine collection. All mothers in the treated group as well as mothers in the control group were asked to collect urine for 24 hours. This was accomplished between the 2nd and 7th day after the delivery. The mothers were told that a study concerning jaundiced infants was running, but not the purpose. When the infants were three months old, the parents received a letter telling about the study. Those who had collected urine during the hospital stay were asked to repeat the collection. They were told that they would receive a telephone call and be asked about their hospital experience. Some mothers in each group failed to collect urine either in the hospital or at the collection three months later. Thus 35 mothers collected two urine samples, 10 in each treated group and 15 in the control group, and were visited at home to obtain information about their hospital experience. The level of urine cortisol was measured according to the routines of the laboratory of clinical chemistry using Famos Cortisol Radioimmunoassay Kits. Paired t -tests were used to compare repeated cortisol determinations in the mothers. After exploring various statistical methods of presenting the data on duration (persistence) of breast feeding, the method shown in Fig. 1 was adopted as most descriptive and at the same time most amenable to the drawing of inferences from proportions as described by Armitage (4).

RESULTS

After delivery, the mothers participating in the study were cared for on two maternity wards. The equal numbers of mothers from the two wards showed no significant difference in

number of breast fed infants. The distribution of birth weight, highest level of bilirubin and the length of treatment time in the two groups is shown in Table 1. The duration of breast feeding (Fig. 1) in the separated group was lower than in the non-separated group throughout the period studied but reached significance only at four weeks of age. The duration of breast feeding in the non-separated and the control groups was similar throughout the 12-week period. The difference between the separated and the control groups was statistically significant at 10, 11 and 12 weeks as well as at four weeks. Differences seen at weeks 5–9 between the separated group and all others, while lacking statistical significance, were nevertheless consistent with the significant observations and tended to support the same clinical conclusions.

No difference was found in the mean cortisol levels between the groups. However, most mothers had a higher cortisol level at the first determination than at the second one, statistically significant difference ($p < 0.01$) in the non-separated and the control groups, but not in the separated group (Table 2).

The interview gave information about the mothers' experiences in the hospital. An attempt has been made to summarize and translate the mothers' statements:

Mothers in the non-separated group

- "I was happy to stay but it was trying"
- "It was wonderful to be together with the baby all the time"
- "I liked to be there but would have preferred to stay on the maternity ward"
- "It was wonderful to be together with my baby"
- "It was a valuable experience to take care of the baby in the incubator"
- "I was nervous about the responsibility"
- "The responsibility was too great"
- "I was happy to stay but worried about the responsibility"
- "The situation was very satisfying"
- "I was happy to be able to stay with my baby"

Table 1. Birth weight, highest bilirubin level and number of days in phototherapy in separated and non-separated groups

	Birth weight, g		Bilirubin, $\mu\text{mol/l}$		Number of days in phototherapy	
	Mean	Range	Mean	Range	Mean	Range
Separated group ($n=14$)	3 200	2 570–4 030	363	260–428	3.9	1–8
Non-separated group ($n=15$)	3 460	2 860–4 300	383	308–460	3.3	1–5

Table 2. The mean value and SD in the mothers' urine cortisol level (nmol/l) at one week and at three months after delivery

	One week after delivery	Three months after delivery	p -value
Separated group ($n=10$)	164 $\pm$ 53	111 $\pm$ 67	NS
Non-separated group ($n=10$)	199 $\pm$ 79	107 $\pm$ 71	<0.01
Control group ($n=15$)	208 $\pm$ 76	124 $\pm$ 73	<0.01

- "I was happy to be there but I missed the other mothers"
- "I did not want to leave my infant, but would have preferred to stay on the maternity ward"
- "It was wonderful to stay, all worries disappeared"
- "I was so happy to be there that I took too much responsibility"

Mothers in the separated group

- "The information was badly given and different meal times were stressful"
- "It was hard to be separated from my baby, I was just getting to know her"
- "I liked the maternity ward but I disliked the different meal times"
- "It is insane to move a healthy baby because some extra light is needed"
- "It was a terrible experience, the infant was moved before I knew her"
- "It was frightening to see her blindfolded"
- "I was upset and had a headache after visiting the baby"
- "I was upset when they transferred my baby to the other ward"
- "Being on two wards was difficult but I did not want to move"
- "It was a hard experience but I was supported by the other mothers"
- "I disliked it, everybody was asleep when I came back from the last feeding"
- "I was upset by the message but I was taken care of"
- "It was laborious to travel between home and the hospital"
- "I was upset but just for a while"

DISCUSSION

The current routines for the treatment of hyperbilirubinemia are, with a few exceptions, to transfer the infant from the maternity ward where the mother is cared for to a paediatric ward. The infants are placed in an incubator, undressed, blindfolded and exposed to phototherapy. In a previous study (3) the investigators showed that these routines have a negative effect on breast feeding.

For the jaundiced infants participating in the current study, several factors were similar: The infants were transferred to the same paediatric ward for the same diagnosis and at about the same age. The care routines were changed for half of the subjects, resulting in a non-separated group where mothers had the same opportunity as the control group to participate in the care of their infants. To some extent they had even more responsibility for the infants' care than the control mothers since most of them not only stayed with their infants during the entire day but also during the night.

The result shows that during the period of investigation the duration of breast feeding in the non-separated group was similar to that seen in the control group and longer than in the separated group. The separated group had a lower frequency of breast feeding than the control group throughout the study period. This is in agreement with the results in the earlier study (3).

The different levels of cortisol excretion in this study could reflect different stressful events happening to the mothers during the periods of urine collection. It was hypothesized that any difference between the first and second collection would be found in the separated group, reflecting the mothers' experience of being separated from their infants. However, the cortisol level in the non-separated group as well as in the control group differed significantly between the collections shortly after delivery and three months later. This difference was not found in the separated group. The reasons for these results are obscure. After the interviews, however, it was obvious that caring for an infant in an incubator around-the-clock involved greater responsibility for mothers in the non-separated group, although they appreciated the opportunity. As expressed by one mother: "This time has been very tough, but I do not regret having been through it. Now I feel strong enough to cope with anything happening to my child". Even caring for a healthy newborn on the maternity ward might to some mothers imply more effort than having somebody else being responsible for the infant's care.

We believe that the mothers in the non-separated group and those in the control group, al-

though they were also together with their infants, felt the responsibility in a different way than did mothers in the separated group, where the responsibility was delivered to the staff.

In the literature there are several suggested reasons for the mothers' success or failure in breast feeding: complications connected with the delivery or illness in the newborn (2, 3); social, cultural and educational factors (5, 6, 7); previous experience with breast feeding (6); lactation difficulties (8); hospital feeding practice (7, 9, 10) and hospital routines (11, 12). De Chateau et al. (11) found that routines such as weighing the infant before and after feeding could negatively influence the success in breast feeding. Helsing & Kjernes (12) reported an increase in breast feeding in Norway during the period 1973–1982. During that period there had been changes in the hospital routines including such innovations as earlier feeding interaction, feeding on demand, and mothers spending more time with their infants. As in that report, the mothers in the present study, who had moved to the paediatric ward with their infants, were feeding their infants on demand and spent almost all the time around-the-clock with their infants.

We conclude that the present phototherapy routines for jaundiced infants including separation from their mothers, should be questioned. Our results suggest the need for a procedure not requiring that mothers and their infants be separated. Preferably the treatment should be carried out on the maternity ward. Such a change is already under consideration.

ACKNOWLEDGEMENTS

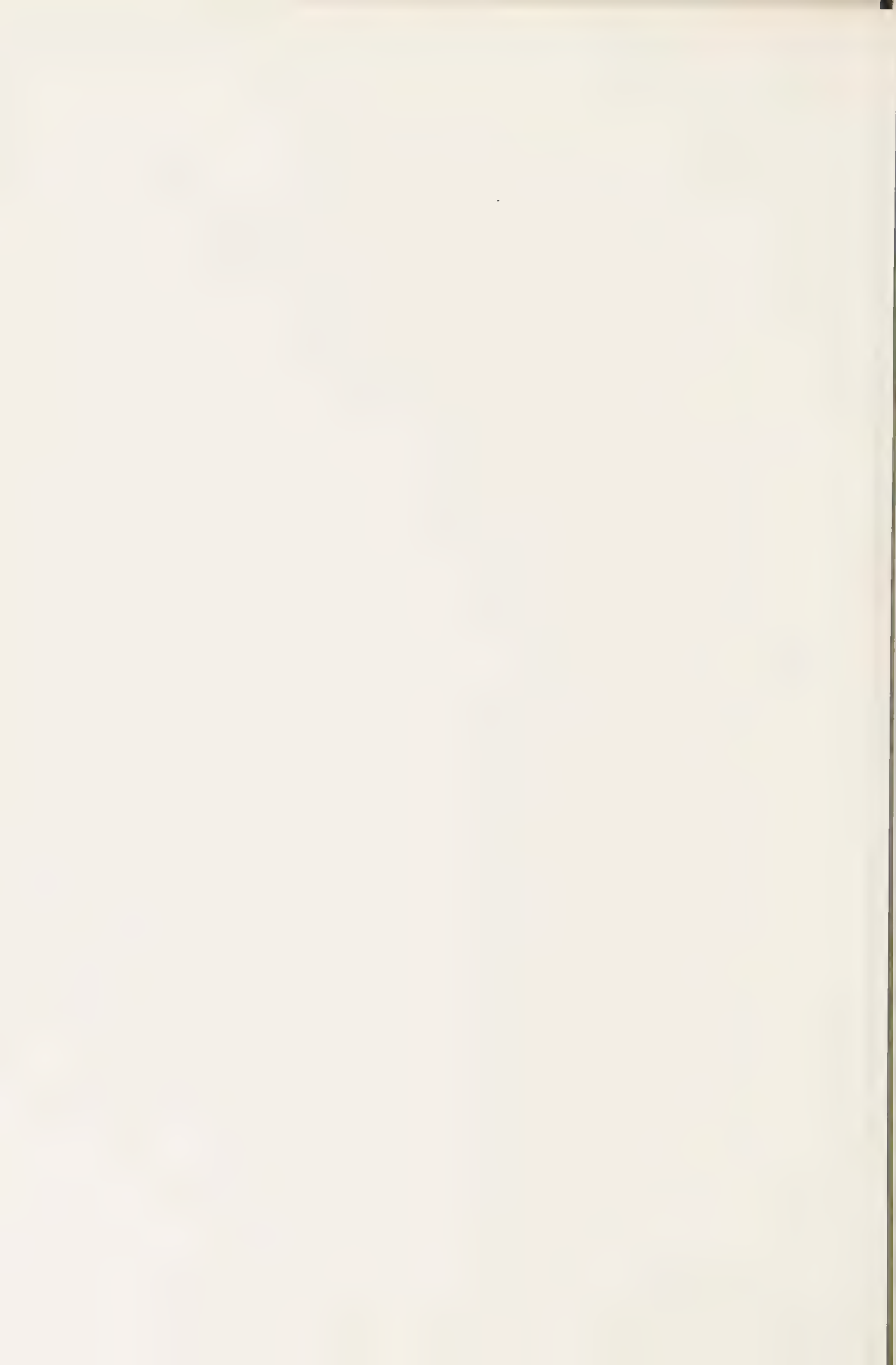
We wish to thank James Bergseng for valuable statistical advice. We are grateful for the linguistic revision by Dr B. J. Pannabecker, University of Colorado, Denver, USA. We appreciate the support from the staff at the paediatric ward and at the Department of Clinical Chemistry, Central Hospital, Helsingborg. The study was supported by Malmöhus County Council, the Medical Faculty, University of Lund and Föreningen Mjölkdroppen, Helsingborg.

REFERENCES

- Whiten A. Assessing the effects of perinatal events on the success of mother–infant relationship. In: Schaffer HR, ed. *Studies in mother–infant interaction*. New York: Academic Press, 1977: 403–25.
- Tamminen T, Verronen P, Saarikoski S, Göransson A, Tuomiranta H. The influence of perinatal factors on breast feeding. *Acta Paediatr Scand* 1983; 72: 9–12.
- Elander G, Lindberg T. Short mother–infant separation during the first week of life influences the duration of breast feeding. *Acta Paediatr Scand* 1984; 73: 237–40.
- Armitage P. *Statistical methods in medical research*. Oxford and Edinburgh: Blackwell Scientific Publication, 1971.
- Ståhlberg MR. Breast feeding and social factors. *Acta Paediatr Scand* 1985; 74: 36–39.
- West CP. Factors influencing the duration of breast feeding. *J Biosoc Sci* 1980; 12: 325–31.
- Hally MR, Bond J, Crawley J, Greyson B, Philips P, Russel I. Factors influencing the feeding of the first-born infants. *Acta Paediatr Scand* 1984; 73: 33–39.
- Verronen P. Breast feeding: Reasons for giving up and transient lactational crisis. *Acta Paediatr Scand* 1982; 71: 447–50.
- Loughlin HL, Clapp-Channing NE, Gehlbach SH, Pollard JC, McCutchen TM. Early termination of breast feeding: Identifying those at risk. *Pediatrics* 1985; 75: 508–13.
- Gray-Donald K, Kramer MS, Munday S, Leduc DG. Effect of formula supplementation in the hospital on duration of breast feeding. A controlled clinical trial. *Pediatrics* 1985; 75: 514–18.
- de Chateau P, Holmberg H, Jakobsson K, Winberg J. A study of factors promoting and inhibiting lactation. *Dev Med Child Neurol* 1977; 19: 575–84.
- Helsing E, Kjernes U. A silent revolution—Changes in maternity ward routines with regard to infant feeding in Norway 1973–1982. *Acta Paediatr Scand* 1985; 74: 332–37.

Submitted Dec. 16, 1985. Accepted Febr. 20, 1986

(G. E.) Department of Paediatrics
Central Hospital
S-251 87 Helsingborg
Sweden



Breast feeding of infants diagnosed as having congenital hip joint dislocation and treated in the von Rosen splint

G. Elander

Separation of a mother from her baby during the puerperium may adversely affect the chances of successful breast feeding. To assess whether treatment during early infancy which does not cause separation has a similar effect, the breast feeding rates of 30 infants with unstable or dislocated hip treated in a von Rosen splint for 6 to 12 weeks were compared with the rates in 113 healthy, full term random controls. Overall the group with splints was less successful in breast feeding but this may be a reflection of complicated delivery which was more common in this group, rather than of the splinting itself.

INTRODUCTION

Comprehensive research has shown that breast feeding is beneficial in various ways to both mothers and infants (Winberg & Wessner 1971, Gerrard 1974, Crow *et al* 1980, Ferguson *et al* 1982) and this is now the preferred method of feeding when possible.

There is evidence that events during the early puerperium, the time when breast feeding is being established, may influence the mother's ability to breast feed. One Finnish study (Tamminen *et al* 1983) has shown that infants born by Caesarean section or assisted delivery, premature infants or infants with asphyxia, do not begin breast feeding as frequently as do full term, healthy infants. The study however, suggests that such factors do not influence the length of breast feeding once it has been established. Separation due to the infant's transfer to a special care nursery has also been

implicated. In a previous study (Elander & Lindberg 1984) we found that mothers who had been separated from their full term infants for minor illnesses e.g. hyperbilirubinaemia, respiratory distress, suspected infections (mean time of separation 3.3 days), breast fed for a significantly shorter period than did control mothers who were not separated. This occurred despite the involvement of the mothers in the care of their baby and it was not clear from this study whether the finding reflected the separation per se, the mother's decreased responsibility for the infant's care, or the disappointment in having given birth to an infant with a medical problem.

To clarify this, we studied the effects on breast feeding rates of a special neonatal treatment which did not require separation from the mother. The establishment and continuation of breast feeding of infants who were born with congenital hip dislocation and treated in a splint for an average of 10 weeks (but not separated from their mother) were compared with the equivalent rates in a group of randomly selected control babies. The parents' experiences of caring for babies with splints were also described.

Gunnel Elander RN BSc, Department of Paediatrics,
University of Lund, General Hospital, 21401 Malmö,
Sweden

Manuscript accepted

Sample and method

The babies were selected from two different hospitals in two cities in southern Sweden. Thirty infants were diagnosed as having unstable or dislocated hips. The diagnosis was made during the first few days of life and the child was treated with the von Rosen splint (von Rosen 1956). The babies were kept in the splint for 6–12 weeks (average 10 weeks), the length of time depending upon hospital routines and the severity of the dislocation. The parents were involved in the treatment from the very beginning and they were never, due to treatment alone, separated from their infant. Once a week the parents visited the orthopedic clinic where the infants were taken out of the splint. The parents were not allowed to remove the infant from the splint at any time.

The control group consisted of 113 full term, healthy infants, selected as follows: for each of the 30 infants who were treated in the splint, the first four infants, born at the same hospital and on the same date as one of the treated infants, were chosen as controls. Seven of these families could not be reached by letter or telephone, leaving 113 infants as controls.

The method of inquiry was a telephone interview, lasting for about 30 min in the treated group and about 10 min in the control group. The aim of the interview was to collect information about the child's sex, number of siblings, delivery, general

health and type of feeding since delivery. Another aim was to obtain information about the parents' experience of taking care of their infant during the treatment period. The interview was carried out when the infants were about 3 months old. Before that time, the parents were not aware of the study. Shortly before the interview, the parents received a letter about the study explaining that they could choose whether or not to participate.

Statistics: For 2×2 contingency tables, *p*-value was calculated using Fisher's 'exact *p*'; in the case of time series, proportions still breast fed were compared according to methods described by Armitage (1971) for inference from proportions.

Findings

The distribution of baby's sex and mother's parity and mode of delivery in the treated and control group is illustrated in Table 1. The complicated

Table 1
Sex, parity and type of delivery in treated and control groups

	Treated group (n=30)	Control group (n=113)
Boys	6 (20%)	61 (54%)
Primiparous	15 (50%)	54 (48%)
Complicated delivery	9 (30%)	5 (4%)



Fig. 1. An infant in the von Rosen splint

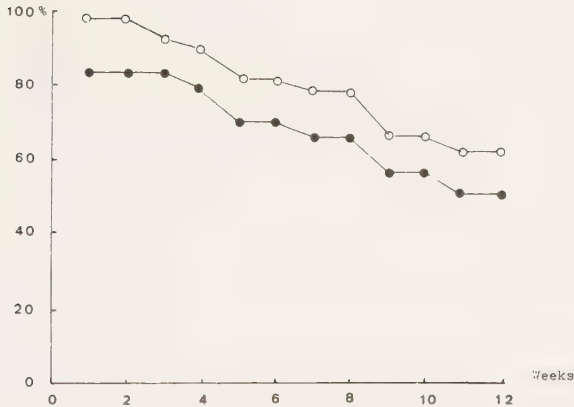


Fig. 2. Breast feeding in control (O $n=113$) and hip joint dislocated infants (● $n=30$). Cumulative probability (p) of continued breast feeding at start of interval (week). $p<0.003$ (1-tailed) at one week after birth.

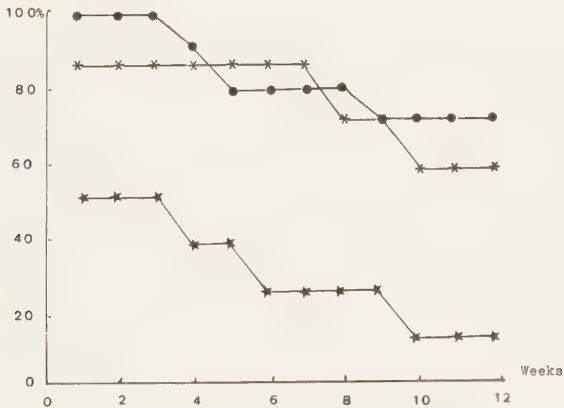


Fig. 3. Breast feeding in treated groups, multiparous mothers with normal deliveries (● $n=14$), primiparous mothers with normal deliveries (* $n=7$) and primiparous mothers with complicated deliveries (★ $n=8$). Cumulative probability (p) of continued breast feeding at start of interval (week). The differences in breast feeding between normal and complicated deliveries in primiparous mothers with treated infants, was statistically significant ($p<0.05$) from the fourth week after the delivery and throughout the period studied.

deliveries included vaginal breech delivery, instrumental delivery, and Caesarean section. The complications were due to the infant's position. The establishment and continuation rates of

unsupplemented breast feeding are shown in Figure 2.

The frequency of breast feeding in the treated group was lower than in the control group and the

Table 2
Areas of problems mentioned by parents of infants with congenital hip joint dislocation (n=30)

Problem areas	Number of parents
Got upset about the diagnosis	6
Information badly given	3
Worried all the time	4
Practical problems	18
Skin irritation	4
Poor contact with the infant	6
Clothing problems	4

difference between these two groups was statistically significant ($p < 0.003$) at one week after birth. After that time the decline in breast feeding rates was nearly parallel in the two groups. Mothers in the treated group seemed to breast feed for a significantly shorter period if they were primiparous. However, eight of these primiparous women had experienced a complicated delivery, compared with only one of the multiparous women. The difference in breast feeding between normal and complicated deliveries in primiparous mothers with treated infants, was statistically significant ($p < 0.05$) from the fourth week after delivery and throughout the period studied.

Figure 3 shows that primiparous women in the treated group, who had experienced a complicated delivery, were less successful in breast feeding than those (primiparous and multiparous) with normal delivery. The difference in breast feeding between normal and complicated deliveries in primiparous women was statistically significant ($p < 0.05$) from the fourth week after the delivery. Information concerning the parents' experience regarding the care of infants, who were treated in the splint, could be categorized into specific problem areas, (Table 2), the most common being practical difficulties associated with the splint.

DISCUSSION

Overall, the mothers of infants born with congenital hip joint dislocation and treated in a splint for 6-12 weeks were less successful at breast feeding

than mothers of healthy infants. However the finding should be interpreted with caution because the frequency of complicated deliveries in the treated group was higher than in the control groups, a difference which was largely confined to the primiparae. Although the groups are too small for firm conclusions, it seems likely that complicated delivery rather than the splint is the cause for the less successful breast feeding. This finding is in agreement with that of Tamminen *et al* (1983).

Breast feeding rates amongst the primiparous with treated babies following uncomplicated deliveries and amongst primiparous in the control group were similar to those of the multiparae. There are different opinions as to whether the frequency of breast feeding is different between primiparous and multiparous women. West (1980) reported that parity did not influence the duration of breast feeding, but that multiparous women, who had experienced a previous successful breast feeding, were more likely to breast feed for longer period than those who had been less successful. Stahlberg (1985) reported that the length of breast feeding was unaffected by sex, number of siblings or birth order amongst siblings.

The mothers in the treated group expressed their satisfaction in having been able to support their infants. Although they found the treatment period very trying, they felt responsible for the care of their infants and seemed to be proud of how they, in different ways, had managed to solve problems connected with the care, that had to be painstaking in order to avoid sores from the splint. Practical problems were the most common but emotional ones were also mentioned by the parents (Table 2).

CONCLUSION

The study suggests that mothers who are caring for their infants in a splint are less successful in starting breast feeding than mothers of healthy infants but this may be due to a complicated delivery rather than to the splinting. Once breast feeding becomes established in the mothers of

infants in a splint, the rate of success is similar to that of the mothers of healthy infants.

From this research it is not possible to assess the extent to which special support and encouragement by nurses and midwives would overcome the problems associated with splint treatment following a complicated delivery. Nevertheless, it seems reasonable to recommend that a special effort should be made to help this group establish and then continue breast feeding as successfully as possible.

References

- Armitage P 1971 (Ed. 1980) *Statistical Methods in Medical Research*. Blackwell Scientific Publication, Oxford & Edinburgh
- Crow R A, Fawcett J N, Wright P 1980 Maternal behaviour during breast- and bottle feeding. *Journal of Behavioral Medicine* 3: 259-277
- De Chateau P, Holmberg H, Jacobsson K, Winberg J 1977 A study of Factors Promoting and Inhibiting Lactation. *Developmental Medicine and Child Neurology* 19: 573-584.
- Elander G, Lindberg T 1984 Short mother-infant separation during the first week of life, influences the duration of breast feeding. *Acta Paediatrica Scandinavica* 73: 237-240
- Ferguson D, Beutrais A, Silva P 1982 Breast feeding and cognitive development in the first seven years of life. *Social Science and Medicine* 16: 1705-1708
- Gerrard J W 1974 Breast feeding: Second thoughts. *Paediatrics* 54: 757-764
- Stahlberg M R 1985 Breast feeding and social factors. *Acta Paediatrica Scandinavica* 74: 36-39
- Tamminen T, Verronen P, Saarikoski S, Goransson A, Tuomiranta H 1983 *Acta Paediatrica Scandinavica* 72: 9-12
- Von Rosen S 1956 Early diagnosis and treatment of congenital dislocation of the hip joint. *Acta Orthopaedica Scandinavica*
- West C 1980 Factors influencing that duration of breast feeding. *Journal of Biosocial Science* 121: 325-331
- Winberg J, Wessner G 1971 Does breast milk protect against septicaemia in the newborn? *Lancet* May 29: 1091-1094



CAREGIVER-INFANT INTERACTION:

AN EXPLORATORY STUDY OF THE FEEDING SITUATION IN SWEDISH HOSPITALS

Gunnel Elander, R.N., BSc., Department of Paediatrics,
General Hospital, Malmö, University of Lund, Sweden.

Betty Jean Pannabecker, R.N., PhD., Department of Psychiatry,
University of Colorado, Denver, Colorado, U.S.A.

ABSTRACT

This study investigated the interaction between caregivers and infants in hospitals. The Nursing Child Assessment Feeding Scale (NCAFS) was used to study behavior differences.

Infants born preterm and term were compared as well as parents and nurses. The relationship between caregiver and infant behavior during feedings was observed.

Preterm infants showed a lower score than did full-term infants when fed by parents but not when fed by nurses. No differences were found between nurses' and parents' scores. There was a significant correlation between the behavior of infants and caregivers. The correlation was stronger in nurse-infant pairs than in parent-infant pairs.

Key words: Infants caregiver, hospital, feeding, interaction

In recent years there has been a strong emphasis on parents' staying in the hospital with their ill children. There is less consistent emphasis when infants under six months of age are ill. In a recent study (Elander 1986) it was shown that in Sweden about 36% (1982) and 54% (1983) of hospitalized infants under six months of age had their parents staying in the hospital. Most of those who stayed were breast feeding. Parents who did not stay over night, rarely visited their infants at feeding times.

Many more people are involved in the care of infants in hospitals today than was the case previously. This change is due to a decrease in working hours for nurses, an increase in part time workers, possibilities for nurses in Sweden to stay at home when their own children are ill, a change in hospital organization from primary nursing to team nursing. Thus, in addition to being sick, hospitalized infants under six months of age are taken care of by many different caregivers, a situation whose effect on the infant is unknown.

One of the most important sources of stimulation in the infant's environment is the major caregiver. The feeding situation provides a continuing source of stimulation to which the infant begins to respond contingently. Synchrony (Condon and Sander 1974) develops between the caregiver and the infant and is disrupted when a new caregiver is introduced into the situation.

Synchrony or reciprocity (Brazelton et al. 1975) or contingent behavior (Yarrow et al. 1975) is seen in verbal and non-verbal behavior beginning with the burst-pause sucking pattern of the newborn. During the sucking pauses the caregiver performs interactive behaviors such as jiggling the infant, talking to the infant, smiling etc, and the infant begins to expect interaction with the caregiver. Reciprocity continues to be seen throughout life in interactions between individuals.

Infants and caregivers are assumed to be different and to behave differently. According to the concept of synchrony, the infant's behavior thus would be different with different caregivers. The feeding situation is a frequently occurring event, which provides excellent possibilities for caregiver-infant interaction, and observation of interaction behavior.

Caregiver-infant interaction

The purpose of this study was to investigate hospitalized infants under six months of age regarding caregivers, e.g. parents and nurses. The interaction between infants and caregivers during feedings in the hospital was observed. The areas to be investigated were: The number of caregivers involved, behavior differences between individual caregivers, between groups of parents and nurses as caregivers and correlations between the behavior of caregiver and infant.

METHOD

The study was carried out during the summer of 1984. Subjects were selected from five wards in three hospitals in southern Sweden. The aim was to obtain infants who were not affected by illness. Thus each day during the study period the hospitals were contacted in order to get an appropriate infant for the study. This involved changing hospitals once or twice a week when infants being observed were discharged. Feeding observations were performed at 10:00-11:00 a.m., 1:00-2:00 p.m. and 3:00-4:00 p.m. These times were chosen in order to get as many feedings as possible since they included babies who were fed every three hours as well as every four hours. Before the study began, the staffs on the five wards were informed. In addition, permission was requested from the caregiver before each feeding observation. Information given to feeders, which included mothers, fathers and nurses emphasized the fact that we were interested in behavior of infants at different ages under six months. None of the feeders declined to participate in the study, nor did the observations seem to be stressful to them. One mother whose previous infant had died, requested that we not make a second observation but had agreed to a first one.

Infants: Criteria for subject selection were:

- (1) Under six months of age. Infants born preterm must have reached a postconceptional age of 37 weeks.
- (2) Receiving breast, bottle or solid feedings.
- (3) Not suffering from acute or severe illness.

The group included 22 infants, 11 boys and 11 girls. Fourteen infants were born at term (group 1) and observed at age 1-23 weeks (mean 8 weeks). Eight infants were born preterm (group 2) and were observed at about 37 weeks postgestational age, or 1-11 weeks post-birth (mean 4 weeks).

Caregiver-infant interaction

The infant's condition was categorized as:

Not affected: Infants close to discharge after surgery, admitted for examinations, or infants in splint (eight infants born at term were included in this group)

Mildly affected: Eye infection, congenital heart disorders, prematurity (six infants born at term and eight infants born preterm were included in this group).

Nursing Child Assessment Feeding Scale (NCAFS): This instrument was used for assessing caregiver-infant interaction (Barnard et al. 1978). Reliability and validity data of the scale are presented by Barnard et al. (1984). The NCAFS consists of 76 items divided into six subscales which are scored as present or absent (1 or 0). The four parent/caregiver subscales are: (1) Sensitivity to infant cues, (2) Response to infant distress, (3) Cognitive growth fostering and (4) Social growth fostering. The two subscales for infant behavior are: (1) Clarity of cues and (2) Responsiveness to parent/caregiver. Behaviors scored as present are totaled to give a maximum score of 76. The totaled score was processed and analyzed.

Interaction scale: Eighteen behavior items that measured synchrony (Quillan 1983) were selected from the NCAFS items and were then processed separately (see Appendix).

Feeding observations were made by two observers (GE and BJP) with a mean agreement of 94% (range 89% to 97%) obtained by joint observation of 15% of the feedings throughout the study. Observers were alternated so that infants who were observed more than once were rated by both observers.

Statistics used included t-tests (two-tailed) and analysis of variance for differences between groups and Pearson's correlation for relationship between feeder and infant.

RESULTS

Infants born at term (group 1) were observed during 33 feedings, of which 16 were performed by the parents (12 by mothers and four by fathers and 17 by 14 different nurses. Infants born preterm (group 2) were observed during 20 feedings, 12 performed by mothers and one father and eight performed by seven different nurses. The feedings included 11 breast, two solid and 40 bottle feedings, (Table 1).

Caregiver-infant interaction

Table 1

Numbers of feedings observed

	Nurses		Parents		Total
	Solid	Bottle	Bottle	Breast	
Full-term (gr.1)	2	15	9	7	33
Preterm (gr.2)	0	8	8	4	20
Total feed.	2	23*	17	11	53

* by 21 different nurses

Twenty infants were observed for two to four feedings and two infants were observed for one feeding. The observations spanned a period of two to three days for most infants.

Three infants were seen over a period of four to eight days. Analysis of variance indicated no difference in the NCAFS total scores related to sex of infant, hospital, method of feeding or infant condition. A significant difference was found between feedings performed in the mornings (10:00 and 11:00) compared with feedings in the late afternoon (3:00 and 4:00 p.m., Table 2) although there were no differences in the length of feeding related to time of day (Table 3).

Using the full scale as well as the interaction scale, the feedings of infants born preterm showed a significantly lower score than infants born at term when fed by parents (Table 4). There was no difference between these groups when fed by nurses. No significant difference was found when parents and nurses were compared regardless of whether they were feeding infants born term or preterm (Table 4).

There was a significant correlation between nurse-infant pairs of infants born at term. Correlations were higher on the interaction scale (Table 5) than on the full scale for all caregivers. Correlation was not significant between caregivers and infants born preterm except between nurse-infant pairs.

Mean NCAFS scores related to time of day

Full Scale		10-11 a.m.	1-2 p.m.	3-4 p.m.
Nurses	$\bar{x}$	55	53	65 1)
	s.d.	10	6	4
Parents	$\bar{x}$	53	54	60 2)
	s.d.	9	7	7

Nurses	$\bar{x}$	11	11	14 3)
	s.d.	4	3	1
Parents	$\bar{x}$	11	10	13
	s.d.	3	4	3

- 1) the 3-4 p.m. score was significantly different from the 10-11 a.m. ($p<0.05$) and 1-2 p.m. ($p<0.01$)
- 2) the 3-4 p.m. score was significantly different from the 10-11 a.m. score ($p<0.05$) but not from the 1-2 p.m. score
- 3) the 3-4 p.m. score was significantly different from the 1-2 p.m. score ($p<0.01$)

Mean length of feeding related to time of day

		10-11 a.m.	1-2 p.m.	3-4 p.m.
Nurses	$\bar{x}$ *	2.00	2.63	2.43
	s.d.	.82	.72	.53
Parents	$\bar{x}$	2.65	2.86	2.75
	s.d.	.70	.90	.96

```
* time valuse used: 1= 0-10 min.      3= 23 min.
                    2= 10-20 min.     4= over 30 min.
```


Caregiver-infant interaction

Table 4

Group comparison of feeding scoresFull scale scores

	<u>Preterm</u>		<u>Full-term</u>		<u>t</u>
	<u>$\bar{x}$</u>	s.d.	<u>$\bar{x}$</u>	s.d.	
Parents	51	5	60	7	-3.77 **
Nurses	54	8	58	9	-1.23
<u>t</u>	-0.74		0.65		

Interaction scale scores

	<u>Preterm</u>		<u>Full-term</u>		<u>t</u>
	<u>$\bar{x}$</u>	s.d.	<u>$\bar{x}$</u>	s.d.	
Parents	10	2	13	3	-3.00 **
Nurses	10	3	13	3	-2.03
<u>t</u>	0.12		0.36		

Table 5

Correlation of feeding scores

	Full scale	Interaction scale
<u>Full-term infants</u>		
Parent:infant (16 pr)	0.49	0.75 ***
Nurse: infant (17 pr)	0.79 ***	0.84 ***
<u>Preterm infants</u>		
Parent:infant (12 pr)	-0.36	-0.25
Nurse:infant (8 pr)	0.78 *	0.42

* p<0.05

** p<0.01

*** p<0.001

Caregiver-infant interaction

DISCUSSION

Earlier research has shown that multiple caregivers influence the infant's behavior. Sander et al. (1979) found that infants cared for by a single caregiver showed less crying, more awake time in daytime and more sleep time at night than infants cared for in the nursery by multiple caregivers. Burns et al. (1972) showed that more distress occurred during feedings when 10-day-old infants who had been consistently cared for by a single caregiver were transferred to a second single caregiver. The infants included in our study varied in different ways, e.g. conceptional age, age after birth, weight, length of time spent in the hospital and condition. These differences should be kept in mind when the groups are compared.

Although there were no difference in the NCAFS scores between the groups of caregivers (nurses and parents), the high variance is an indication of individual differences between feeders and infants (Table 4). Most parents had a 6-point range in their scores when feeding their own infant. One mother, however, who generally had scores of 45-48, scored 36 after she had been told that her baby had to eat more before he could be discharged. This is one example of the effect of external events on the feeding situation.

It was not possible to compare the nurses' scores when feeding the same baby since they rarely fed a baby more than once during our observations. This suggests that infants may have to deal with many different caregivers while in the hospital.

When we compared the groups of infants born at term and preterm, preterm infants scored lower than infants born at term. This result is in agreement with previous authors (Alfasi et al. 1985, Barnard et al. 1982).

The difference in feeding scores between groups 1 and 2 could be due to the long hospitalizations of the infants born preterm, or because they function differently.

We found a high positive correlation between nurse-infant scores on the NCAFS scale. For example one infant, born at term, who was fed by two nurses, had different scores for two feedings at the same time on consecutive days.

Caregiver-infant interaction

With nurse I, whose score was 32, the infant's score was 9, whereas with nurse II, whose score was 45, the same baby's score was 18. One infant, born preterm and fed by the same nurse twice in the same day, scored 14 and 10 respectively when the nurse's scores were 42 and 33.

Out of the total NCAFS scale, 18 items (interaction scale) were processed separately since they were found to be a more sensitive estimate of synchrony (Quillan 1983). We found a higher correlation on this scale with parent-infant pairs than on the full NCAFS scale. This indicates that the interaction scale measures something different than the total scale. Many of the safety and positioning items included in the NCAFS have been taught to nurses and have become routine to them. Parents, however, may not yet have learned to do these consistently. The strange environment might also influence the parents' behavior regarding non-interactive items more than interactive ones.

There was a significant difference in the feeding scores at different times of the day. The feedings before noon (10.00 and 11.00) received lower scores than did late afternoon feedings (3.00 and 4.00 p.m.). It has been our experience that nurses are busier in the morning than in the afternoon and may have interacted less with the infants. The trend was for an increase in the length of time for the feedings after lunch although this was not significant. In summary: We have found that infants who are hospitalized without their parents are cared for by multiple caregivers. Using the NCAFS we found differing behaviors in different caregivers but also a significant correlation between their behaviors and the behavior of the infants born at term. This indicated to us that the infants were able to respond to the differing behaviors of their caregivers. The parents' behaviors were less significantly correlated than the nurses' on the total NCAFS, but highly correlated on the interaction scale. We do not know whether the scale we used was sensitive enough to accurately assess interactions between infants and caregivers, subsequently a second study using a different method is in progress.

Caregiver-infant interaction

REFERENCES

- Alfasi G, Schwartz F, Brake S C, Fifer W P, Fleichman A R, Hofer M A. 1985. Mother-infant feeding interactions in preterm and full-term infants.
Inf Beh Dev 8:167-180
- Barnard K E. 1978. NCAST Nursing Child Assessment Feeding Scales. Seattle, University of Washington
- Barnard K E, Bee H L, Hammond M A. 1982. Developmental changes in maternal interactions with term and preterm infants. Seattle, University of Washington
- Barnard K E, Eyres S, Lobo M, Snyder C. 1984. An ecological paradigm for assessing and intervention.
In T B Brazelton, B M Lester (Eds). New approaches to developmental screening of infants. New York: Elsevier
- Burns P, Sander L W, Stechler G, Julia H. 1972. Distress in feeding
Short-term effects of caretaker environment of the first 10 days.
J Am Acad Child Psychiatr 11:427-439
- Brazelton Y B, Koslowski G, Main M. 1974. The origins of reciprocity: The early mother-infant interaction.
In M Lewis, L A Rosenblum (Eds). The effect of the infant on its caregiver. New York: Wiley
- Elander G. 1986. The effects of perturbation on mother-infant interaction: studies of hospitalization, especially during the first six months of life. Dissertation, University of Lund, Sweden
- Sander L W, Stechler G, Burns P, Lee A. 1979. Change in infant and caregiver variables over the first two months of life: Integration of action in early development.
In E B Thomas (Ed). Origins of the infants' social responsiveness. Hillsdale N J: Erlbaum

Caregiver-infant interaction

Quillan S E. 1983. Growth and development of infant and mother and mother-infant synchrony. Dissertation, Wayne State University, Detroit, Michigan

Yarrow L J, Rubenstein J L, Pedersen F A. 1975. Infant and environment.
New York: Wiley

Caregiver-infant interaction

APPENDIX

Interaction scale items:

6. Parent smiles, verbalizes or makes eye contact with child when in open-face gaze position.
12. Parent allows pauses in feeding when the child indicates by cry face, halt hand, back arching, pulling away, pushing food away, tray pounding, turning head, shaking head no or saying "no" or falling asleep or when child is in pause phase of the burst-pause sequence of sucking (75% of the time).
13. Parent slows pace of feeding or pauses when child averts gaze, places hand-to-ear, hand-to-mouth, hand-behind-head, hand-back-of-neck, hands over stomach, yawns, rubs eye or displays feet movement (75% of the time).
14. Parent terminates the feeding when child turns head, falls asleep, compresses lips, pushes food away, shakes head no or says "no", once more or after other methods (repositioning, burping or waiting) have proved unsuccessful.
15. Parent does not interrupt child's sucking or chewing by removing the nipple, jiggling the nipple or offering the child more or other kinds of food while child is eating.
16. Parent does not offer food when the child looks away, looks down, turns away or turns around.
30. Parent succeeds in making eye contact with child once during feeding.
38. Parent smiles, verbalizes or touches child within 5 seconds of child smiling or vocalizing at parent.
39. Parent does not compress lips, grimace or frown when making eye contact with child.
48. Parent verbalizes to child within 5 seconds after child has vocalized.
49. Parent verbalizes to child within 5 seconds after child's movement of arms, legs, hands, head, trunk.
59. Child makes contact with parent's face or eyes at least once during feeding.
66. Child responds to feeding attempts by parent during feeding.
67. Child responds to games, social play or social cues of parent during feedings.
68. Child looks in the direction of the parent's face after parent has attempted to alert the child verbally or non-verbally during feeding.
70. Child vocalizes or smiles within 5 seconds of parent's vocalization.
73. Child shows a change in level of motor activity within 5 seconds of being handled or repositioned by parent.
75. Child shows potent negative cues within 5 seconds after parent moves closer than 7 or 8 inches from child's face.

BEHAVIOR IN FOUR YEAR OLD CHILDREN WHO HAVE EXPERIENCED
HOSPITALIZATION AND DAYCARE:

A Retrospective study

Gunnel Elander, R.N., BSc., Department of Paediatrics,
General Hospital, Malmö, University of Lund, Sweden

Alf Nilsson, PhD., Department of Applied Psychology,
University of Lund, Sweden

Tor Lindberg, M.D., PhD., Department of Paediatrics,
Central Hospital, Helsingborg, Sweden

ABSTRACT

All four-year-old children (n=535), who during one year visited 12 health-care centers for a general screening, were investigated in terms of behavior in relation to earlier experiences of hospitalization and daycare.

The Child Behavior Checklist for ages 2-3, developed by Achenbach, was used. The results show significant difference in behavior between hospitalized and non-hospitalized children, who had been exposed to daycare. If the children had been cared for at home, no difference in any behavior was found between hospitalized and non-hospitalized children. Repeated hospital admissions increased the behavior differences.

Key words: Hospitalization, daycare, behavior, children

Separation from parents through hospitalization has been described as a psychological upset for preschool children. (2,3,7,10).

Different acute symptoms, shown during the hospital stay, have been divided into three phases: protest, despair and denial or detachment (7). After discharge from the hospital, children often show some short-term symptoms, usually eating and sleeping disturbances, regression in bladder control and a more dependent behavior.

Long-term effects of hospitalization have been reported. Douglas (1975) found that children who had been exposed to prolonged or repeated hospital admissions before five years of age were more likely to be troublesome and delinquent as adolescents and to have a more unstable job pattern than those who had not been admitted to a hospital. An attempt to replicate Douglas' findings was made by Quinton et al. in 1976. They found that repeated admissions to a hospital were linked with emotional disturbances and also that this association was stronger in children from disadvantaged homes.

Since these studies were performed, hospital routines have changed in many ways, e.g. shorter hospital stays, increased parent participation in the hospital care and more out-patient treatments.

In Sweden it has become more common for women to have a job outside the home. When a child is born, the mother usually stays at home for 9-12 months and then goes back to work. The children are cared for in daycare centers or family daycare and thus separated from their parents during daytime.

The purpose of this investigation was to study children's behavior at the age of four in relation to hospitalization and daycare. A behavior checklist was used for comparing children who had never been exposed to daycare and hospitalization with those who had received daycare and/or hospital care.

Hospitalization and daycare

MATERIAL AND METHOD

Subjects: All four-year-old children who visited 12 different Swedish health-care centers for a general health screening during the period of June 1983 through May 1984 were included in the study (n=535). Since almost all children in Sweden (about 99%) participate in this screening, it was assumed that the sample would represent a normal population of children regarding sex, number of siblings, socio-economic conditions etc. Parents who did not understand the language well enough to answer the questionnaire (about 2%) were never asked to participate. The health care centers were selected with the aim of representing one large city, a medium one, two small towns and the countryside in southern Sweden.

Method: The questionnaire used in the study consisted of two parts. The first part explained the aim of the study and included questions about the child's sex, number and age of siblings, type of daycare and whether the child had been hospitalized. If the child had been to hospital, there were additional questions, such as the number of admissions, the length of the hospital stay and if the parents had stayed with the child in the hospital. The second part of the questionnaire included the Child Behavior Checklist for ages 2-3 (CBCL). The CBCL consists of 99 behavior items, which were translated into Swedish by one of the authors (GE) of this study. For each item, there were three choices in answering: 0= do not agree, 1= agree and 2= strongly agree. After the forms were filled out, the authors independently classified the items into nine groups of behavior according to the item characteristics. The groups were: somatic symptoms, dependency, reserved-depressive behavior, aggressiveness, anxiety, hyperactive-impulsive behavior, oral tendencies, anal-compulsory behavior and regression. When the classification was compared, 96% of the items had been divided equally by the authors into one of the nine behavior groups, thus a high degree of agreement was found between the authors. Sixteen items from the scale were excluded because they were not appropriate to any of the groups.

Hospitalization and daycare

Procedure: When the parents arrived at the health center, they were given a questionnaire and asked to complete it before they left. They were not allowed to take the questionnaires home. Most parents filled out the forms during the time when the children were being examined. Others remained at the health center for about 20 minutes, the time needed for completing the questionnaire.

Parents who did not want to participate returned the forms to the nurse, who marked it "did not want to participate". Thus it was possible to estimate the dropouts.

Identification of the questionnaire was not possible since neither name nor birth registration was asked for.

About 5% of the parents did not want to participate in the study and those who had omitted more than 10% of the CBCL items were excluded from the study.

The material was processed at the Computer Center, University of Lund, using the Student's t-test (1-tailed).

RESULTS

When the incomplete questionnaires were excluded, 498 forms (93%) remained, representing almost equal numbers of boys and girls. At the time of investigation 201 (40%) of these children had been hospitalized (Table 1). Seven children were born premature and two children had chronic diseases. The remaining children had experienced one or several hospital stays, mostly due to common illnesses.

Table 1

Number of hospitalized and non-hospitalized children receiving daycare (n=498)

	Hospitalized (n=201)	Non-hospitalized (n=297)
Daycare (n=323)	133*	190
No daycare (n=175)	68	107

* 61 children were hospitalized before the debut of daycare

Hospitalization and daycare

Among children who had been hospitalized once ($n=126$), 69 of 88 (78%) in the age group six months or older had had their parents staying during the hospitalization, versus 14 of 38 (37%) in the age group younger than six months.

There was no difference in behavior at four years of age between these two groups.

Significant differences in behavior were found in children who had been admitted to a hospital once versus several times (Table 2). Daycare had been utilized by 323 (65%) of the children (Table 3), usually from about 12 months of age. Three infants began daycare before six months of age.

Table 2

Behavior in hospitalized children ($n=201$) admitted one ($n=126$) versus several times ($n=75$)

	p-value
Somatic symptoms	.038
Dependency	.055
Aggressiveness	.037
Hyperactive/impulsive behavior	.009
Oral tendencies	.053

p was calculated by using Student's t-test (1-tailed)

The majority of children who had been hospitalized had also been to daycare, 133 (66%), (Table 1). Sixty-one (46%) of the children who had been in a hospital and daycare had been admitted to a hospital before the debut of daycare. There were no differences in behavior between boys and girls or between children in different kinds of daycare.

When looking at the whole group there was a significant ($p<0.05$) difference between hospitalized and non-hospitalized children in two groups of behavior, hyperactive-impulsive behavior and regression (Table 3). A difference was found in anxiety behavior

Hospitalization and daycare

between children who had received daycare and children who had not (Table 3).

Table 3

Behavior in children according to hospitalization and daycare (n=498)

	Hospitalized (n=201) versus Non-Hosp (n=297)	Daycare (n=323) versus No Dayc. (n=175)
	p-value	p-value
Hyperactive-impulsive beh.	.008	N.S.
Regression	.038	N.S.
Aggressiveness	.055	N.S.
Anxiety	N.S.	.031

When the children receiving daycare were excluded, there was no difference in any behavior between hospitalized and non-hospitalized children. Similarly, in non-hospitalized children, no difference was found between children who received daycare and children who did not.

Hospitalized children attending daycare differed in anxiety behaviors from hospitalized children not attending daycare, (Table 4).

Children receiving daycare were different in four groups of behavior if they had been hospitalized (Table 4).

Children in daycare who had been hospitalized showed more dependent, aggressive, hyperactive-impulsive and regressive behaviors than children in daycare who had not been hospitalized.

Hospitalization and daycare

Table 4

Behavior in children who have been hospitalized and received daycare.

<u>Hospitalized children (n=201)</u>	
Children attending daycare (n=133) versus no daycare (n=68)	
	p-value
Anxiety	.049
 <u>Children attending daycare (n=323)</u>	
Hospitalized (n=133) versus non-hospitalized (n=190) children	
	p-value
Dependency	.038
Reserved-depressive	.052
Aggressiveness	.042
Hyperactive/impulsive	.014
Regression	.027

DISCUSSION

The results of this study show that children who have been admitted to a hospital are different in terms of hyperactive/impulsive and regressive behaviors compared with non-hospitalized children. Children who have received daycare show more anxiety behavior than children cared for at home.

However, when children who had received daycare were excluded from the sample, there was no significant difference in any behavior between hospitalized and non-hospitalized children. Moreover, when the behaviors of children attending daycare were compared, there were significant differences in four groups of behavior between hospitalized and non-hospitalized children. Thus it might be assumed that children who have been to daycare are more vulnerable and more at risk of being affected by hospitalization.

Children who had been admitted to hospital several times were reported to have more somatic symptoms than children admitted once. This finding was no surprise since parents whose young children have been to a hospital several times might be expected

Hospitalization and daycare

to report somatic symptoms in their children. However, differences in aggressive and hyperactive/impulsive behaviors were also found between the two groups.

Differences in children who have been to a hospital once versus several times have also been reported by Douglas (1975) and Quinton et al. (1976)

The results from this study imply that the combination of hospitalization and daycare is likely to evoke behavior disturbances in children. However, it is possible that the behavior differences between the groups reflect patterns of parent-child interaction rather than the effect of hospitalization-daycare. Roopnarine and Lamb (1979) found that daycare children assessed one week before the debut of daycare were more anxious and insecure than children cared for at home.

Rutter (1981) has reviewed research on the social and emotional sequelae of daycare. We agree with his conclusion: "Although daycare for very young children is not likely to result in serious emotional disturbance, it would be misleading to conclude that it is without risks or effects. Much depends on the quality of the daycare and on the age, characteristics and family circumstances of the child."

In this study 40% of the children had been hospitalized before the age of four. The hospital stays, however, did not last long. In the 231 admissions that were reported 116 lasted three days or less (35 lasted just one night) and only 15 stays lasted more than 14 days.

Most children admitted to a hospital had also been utilizing daycare (65%). Children in daycare are usually more exposed to infections and subsequently might be in need of hospital care to a greater extent than do children who are cared for at home. But in this study 50% of the children had been hospitalized before the introduction of daycare.

In the present study social conditions were not specifically investigated, but according to the nurses in charge of the health centers, the children participating in the study had a "normal" background. However, even if the social conditions of a family seem to be satisfactory, there might be problems and some parents may be more likely than others to let their children go into a hospital.

Hospitalization and daycare

Nylund et al. (1983) have reported that in a typical Swedish suburb where the parents normally had a good education and a job, they surprisingly often had financial problems, possibly due to illness or addiction.

In conclusion: The behavior of the hospitalized children in this study did not differ from that of non-hospitalized children unless they had been receiving daycare. However, it might be questioned whether a common social denominator could have caused this result rather than the daycare. The question needs further investigation.

Hospitalization and daycare

REFERENCES

1. Achenbach T. 1984. Child Behavior Checklist for Ages 2-3. Burlington, Vermont: Department of Psychiatry, University of Vermont.
2. Bakwin H. 1949. Emotional deprivation in infants. *J Pediatr* 35:512-521
3. Bowlby J. 1951. Maternal care and mental health. World Health Organization Monograph, Series 2. Geneva: WHO
4. Douglas J. 1975. Early Hospital Admissions and Later Disturbances of Behavior and Learning. *Dev Med Child Neurol* 17:456-480
5. Nylander T, Zetterström R. 1983. Home environment in a new Stockholm suburb. A prospective longitudinal study. *Acta Paediatr Scand Suppl* 310
6. Quinton D, Rutter M. 1976. Early Hospital Admissions and Later Disturbances of Behavior. An Attempted Replication of Douglas's Findings. *Dev Med Child Neurol* 18:447-459
7. Robertson J. 1953. Film: A two-year old goes to hospital, 16 mm sound 45 minutes
8. Roopnarine J, Lamb M. 1979. The effects of daycare on attachment and exploratory behavior in a strange situation. *Merrill-Palmer Quart* 24:85-95
9. Rutter M. 1981. Social-emotional consequences of daycare for preschool children. *A J Orthopsychiatr* 51: 4-28
10. Stacey J. 1970. Hospital, children and their families. London: Rutledge and Keagan Paul
11. Spence J. 1947. The care of children in hospital. *Br Med J* 4490: Jan 125-130

APPENDIX 1

USUAL FEEDING TIME (CIRCLE)
YES NO

PERSON OBSERVED IN INTERACTION (CIRCLE)
MOTHER FATHER OTHER

MAJOR CAREGIVER (CIRCLE)
YES NO

TYPE OF FEEDING (CIRCLE)
BREAST BOTTLE SOLID

LENGTH OF FEEDING (CIRCLE)
10 OR LESS 10-20 20-30 30 OR MORE

SETTING (CIRCLE)
HOME CLINIC OTHER

UNIVERSITY OF WASHINGTON SCHOOL OF NURSING NURSING CHILD ASSESSMENT TRAINING

FEEDING SCALE (BIRTH TO ONE YEAR)

CHILD'S FIRST NAME _____

CHILD'S AGE (IN MONTHS) _____

CHILD'S SEX _____

CHILD'S RACE _____

PARTY _____

MOTHER'S EDUCATION (CIRCLE)
8 YRS OR LESS 9-10 11-12 13-14
15-16 17-18 19-20 +

MARITAL STATUS (CIRCLE)
MARRIED NOT MARRIED

MOTHER'S AGE (AT BIRTH OF CHILD) _____

YES NO

1	SENSITIVITY TO CUES		
2	PARENT POSITIONS CHILD SO THAT CHILD IS SAFE BUT CAN MOVE HIS ARMS		
3	PARENT POSITIONS CHILD SO THAT THE CHILD'S HEAD IS HIGHER THAN HIPS		
4	PARENT POSITIONS CHILD SO THAT TRUNK CONTACT IS MAINTAINED DURING MORE THAN HALF OF THE BREAST OR BOTTLE FEEDING (50%)		
5	PARENT POSITIONS CHILD SO THAT EYE-TO-EYE CONTACT IS POSSIBLE		
6	PARENT'S FACE IS AT LEAST 7-8 INCHES OR MORE FROM THE CHILD'S FACE DURING FEEDING EXCEPT WHEN KISSING CARESSING HUGGING OR BURPING THE CHILD		
7	PARENT SMILES VERBALIZES OR MAKES EYE CONTACT WITH CHILD WHEN CHILD IS IN OPEN-FACE-GAZE POSITION		
8	PARENT COMMENTS VERBALLY ON CHILD'S HUNGER CUES PRIOR TO FEEDING		
9	PARENT COMMENTS VERBALLY ON CHILD'S SATIATION CUES BEFORE TERMINATING FEEDING		
10	PARENT VARIES THE INTENSITY OF VERBAL STIMULATION DURING FEEDING		
11	PARENT VARIES INTENSITY OF ROCKING OR MOVING THE CHILD DURING THE FEEDING		
12	PARENT VARIES THE INTENSITY OF TOUCH DURING THE FEEDING		
13	PARENT ALLOWS PAUSES IN FEEDING WHEN THE CHILD INDICATES BY CRY FACE HAT HAND BACK ARCHING PULLING AWAY PUSHING FOOD AWAY FURROWING TURNING HEAD SHAKING HEAD NO OR SAYING NO OR FALLING ASLEEP OR WHEN CHILD IS IN PAUSE PHASE OF THE BURST-PAUSE SEQUENCE OF SUCKING (75% OF THE TIME)		
14	PARENT SLOWS PACE OF FEEDING OR PAUSES WHEN CHILD AVERTS GAZE PLACES HAND-TO-EAR HAND-TO-MOUTH HAND-BEHIND-HEAD HAND-BACK-OF-NECK HANDS OVER STOMACH YAWNS RUBS EYE OR DISPLAYS FEET MOVEMENT (75% OF THE TIME)		
15	PARENT TERMINATES THE FEEDING WHEN THE CHILD TURNS HEAD FALLS ASLEEP COMPRESSES LIPS PUSHES FOOD AWAY SHAKES HEAD NO OR SAYS NO ONCE OR MORE OR AFTER OTHER METHODS (REPOSITIONING BURPING OR WAITING) HAVE PROVED UNSUCCESSFUL		
16	PARENT DOES NOT INTERRUPT CHILD'S SUCKING OR LATCHING BY REMOVING THE NIPPLE JIGGLING THE NIPPLE OR OFFERING THE CHILD MORE OR OTHER KINDS OF FOOD WHILE CHILD IS EATING		
17	PARENT DOES NOT OFFER FOOD WHEN THE CHILD LOOKS AWAY LOOKS DOWN TURNS AWAY OR TURNS AROUND		
SUBSCALE TOTAL (NO. OF YES ANSWERS)			

18	RESPONSE TO DISTRESS INDICATE IN BOX WHETHER OCCURRED OR NOT IF NO DISTRESS MARK EACH BOX YES		
19	IF CHILD SHOWS DISTRESS DURING THE FEEDING DOES THE PARENT		
20	STOP OR START FEEDING IN RESPONSE TO THE CHILD'S DISTRESS		
21	CHANGE THE CHILD'S POSITION IN RESPONSE TO CHILD'S DISTRESS		
22	MAKE POSITIVE OR SYMPATHETIC VERBALIZATION IN RESPONSE TO CHILD'S DISTRESS		
23	CHANGES VOICE VOLUME TO SOFTER OR HIGHER PITCH IN RESPONSE TO CHILD'S DISTRESS		
24	MAKES SOOTHING NON-VERBAL EFFORTS IN RESPONSE TO CHILD'S DISTRESS		
25	DIVERTS CHILD'S ATTENTION BY PLAYING GAMES INTRODUCING A TOY OR MAKING FACES IN RESPONSE TO CHILD'S DISTRESS		
26	PARENT DOES NOT MAKE NEGATIVE VERBAL RESPONSE IN RESPONSE TO CHILD'S DISTRESS		
27	PARENT DOES NOT MAKE NEGATIVE COMMENTS TO HOME VISITOR ABOUT CHILD IN RESPONSE TO CHILD'S DISTRESS		
*NEED ONLY OCCUR ONCE TO SCORE NO			

28	PARENT DOES NOT YELL AT THE CHILD IN RESPONSE TO HIS DISTRESS		
29	PARENT DOES NOT USE ABRUPT MOVEMENTS OR ROUGH HANDLING IN RESPONSE TO CHILD'S DISTRESS		
30	PARENT DOES NOT SLAP HIT OR SPANK CHILD IN RESPONSE TO DISTRESS		
SUBSCALE TOTAL (NO. OF YES ANSWERS)			
31	SOCIAL-EMOTIONAL GROWTH FOSTERING		
32	PARENT PAYS MORE ATTENTION TO CHILD DURING FEEDING THAN TO OTHER PEOPLE OR THINGS IN ENVIRONMENT		
33	PARENT IS IN EN FACE POSITION FOR MORE THAN HALF OF THE FEEDING (50%)		
34	PARENT SUCCEEDS IN MAKING EYE CONTACT WITH CHILD ONCE DURING FEEDING		
35	PARENT'S FACIAL EXPRESSION CHANGES AT LEAST TWICE DURING FEEDING		
36	PARENT ENGAGES IN SOCIAL FORMS OF INTERACTION (PLAYS GAMES WITH CHILD) AT LEAST ONCE DURING THE FEEDING		
37	PARENT USES POSITIVE STATEMENTS IN TALKING TO CHILD DURING THE FEEDING		
38	PARENT PRAISES CHILD OR SOME QUALITY OF THE CHILD'S BEHAVIOR DURING THE FEEDING		
39	PARENT HUMS LAOONS SINGS OR CHANGES THE PITCH OF HIS/HER VOICE DURING THE FEEDING		
40	PARENT LAUGHS OR SMILES DURING THE FEEDING		
41	PARENT USES GENTLE FORMS OF TOUCHING DURING THE FEEDING		
42	PARENT SMILES VERBALIZES OR TOUCHES CHILD WITHIN 3 SECONDS OF CHILD SMILING OR VOCALIZING AT PARENT		
43	PARENT DOES NOT COMPRESS LIPS GRIMACE OR FROWN WHEN MAKING EYE CONTACT WITH CHILD		
44	PARENT DOES NOT SLAP HIT SHAKE OR GRAB CHILD OR CHILD'S EXTREMITIES DURING THE FEEDING		
45	PARENT DOES NOT MAKE NEGATIVE OR UNCOMPLIMENTARY REMARKS TO THE CHILD OR HOME VISITOR ABOUT THE CHILD OR CHILD'S BEHAVIOR		
SUBSCALE TOTAL (NO. OF YES ANSWERS)			
46	COGNITIVE GROWTH FOSTERING		
47	PARENT PROVIDES CHILD WITH OBJECTS FINGER FOODS TOYS AND/OR UTENSILS		
48	PARENT ENCOURAGES AND/OR ALLOWS THE CHILD TO EXPLORE THE BREAST BOTTLE FOOD CUP BOWL OR THE PARENT DURING FEEDING		
49	PARENT TALKS TO THE CHILD USING TWO WORDS AT LEAST THREE TIMES DURING THE FEEDING		
50	PARENT VERBALLY DESCRIBES SOME ASPECT OF THE FOOD OR FEEDING SITUATION TO CHILD DURING FEEDING		
51	PARENT TALKS TO CHILD ABOUT THINGS OTHER THAN FOOD EATING OR THINGS RELATED TO THE FEEDING		
52	PARENT USES STATEMENTS THAT DESCRIBE ASK QUESTIONS OR EXPLAINS CONSEQUENCES OF BEHAVIOR MORE THAN COMMANDS IN TALKING TO THE CHILD		
53	PARENT VERBALIZES TO CHILD WITHIN FIVE SECONDS AFTER CHILD HAS VOCALIZED		
54	PARENT VERBALIZES TO CHILD WITHIN FIVE SECONDS AFTER CHILD'S MOVEMENT OF ARMS LEGS HANDS HEAD TRUNK		
55	PARENT DOES NOT TALK TO BABY TALK		
SUBSCALE TOTAL (NO. OF YES ANSWERS)			

	YES	NO
V CLARITY OF CUES		
51 CHILD SIGNALS READINESS TO EAT		
52 CHILD DISPLAYS A BUILD-UP OF TENSION AT THE BEGINNING OF FEEDING		
53 CHILD DEMONSTRATES A DECREASE IN TENSION WITHIN A FEW MINUTES AFTER FEEDING HAS BEGUN		
54 CHILD HAS PERIODS OF ALERTNESS DURING THE FEEDING		
55 CHILD DISPLAYS AT LEAST TWO DIFFERENT EMOTIONS DURING THE FEEDING		
56 CHILD HAS PERIODS OF ACTIVITY AND INACTIVITY DURING THE FEEDING		
57 CHILD'S MOVEMENTS ARE SMOOTH AND COORDINATED DURING THE FEEDING		
58 CHILD'S ARM AND LEG MOVEMENTS ARE GENERALLY DIRECTED TOWARD PARENT DURING FEEDING (NOT DIFFUSE)		
59 CHILD MAKES CONTACT WITH PARENT'S FACE OR EYES AT LEAST ONCE DURING FEEDING		
60 CHILD VOCALIZES DURING FEEDING		
61 CHILD SMILES OR LAUGHS DURING FEEDING		
62 CHILD AVERTS GAZE, LOOKS DOWN OR TURNS AWAY DURING FEEDING		
63 CHILD ACTIVELY RESISTS FOOD OFFERED		
64 CHILD DEMONSTRATES SATISFACTION AT END OF FEEDING THROUGH SLEEP, FACIAL EXPRESSIONS, DECREASED MUSCLE TONE, ARMS EXTENDED ALONG SIDE, VOCALIZATIONS OR CHANGE IN ACTIVITY LEVEL OR MOOD		
65 CHILD DOES NOT HAVE MORE THAN TWO RAPID STATE CHANGES DURING FEEDING		
SUBSCALE TOTAL (NO. OF YES ANSWERS)		

VI RESPONSIVENESS TO PARENT		
66 CHILD RESPONDS TO FEEDING ATTEMPTS BY PARENT DURING FEEDING		
67 CHILD RESPONDS TO GAMES, SOCIAL PLAY OR SOCIAL CUES OF PARENT DURING FEEDING		
68 CHILD LOOKS IN THE DIRECTION OF THE PARENT'S FACE AFTER PARENT HAS ATTEMPTED TO ALERT THE CHILD VERBALLY OR NON-VERBALLY DURING FEEDING		
69 CHILD VOCALIZES TO PARENT DURING FEEDING		
70 CHILD VOCALIZES OR SMILES WITHIN 5 SECONDS OF PARENT'S VOCALIZATION		
71 CHILD SMILES AT PARENT DURING FEEDING		
72 CHILD EXPLORES PARENT OR REACHES OUT TO TOUCH PARENT DURING FEEDING		
73 CHILD SHOWS A CHANGE IN LEVEL OF MOTOR ACTIVITY WITHIN 5 SECONDS OF BEING HANDLED OR REPOSITIONED BY PARENT		
74 CHILD SHOWS POTENT DISENGAGEMENT CUES DURING LAST HALF OF FEEDING		
75 CHILD SHOWS POTENT DISENGAGEMENT CUES WITHIN 5 SECONDS AFTER PARENT MOVES CLOSER THAN 7 TO 8 INCHES FROM CHILD'S FACE		
76 CHILD DOES NOT TURN AWAY OR AVERT GAZE FROM PARENT DURING FIRST HALF OF FEEDING		
SUBSCALE TOTAL (NO. OF YES ANSWERS)		

ENTER TOTALS FOR EACH CATEGORY	
SENSITIVITY TO CUES	
RESPONSE TO DISTRESS	
SOCIAL-EMOTIONAL GROWTH FOSTERING	
COGNITIVE GROWTH FOSTERING	
CLARITY OF CUES	
RESPONSIVENESS TO PARENT	
TOTAL (NO. OF YES ANSWERS)	

HOME VISIT QUESTIONS

- 1 WOULD YOU SAY THIS WAS A TYPICAL FEEDING?
A. YES B. NO
IF NO, WHY NOT?

- 2 WERE YOU UNCOMFORTABLE DURING ANY PART OF THE FEEDING DUE TO MY PRESENCE?
A. YES B. NO
IF YES, WHY?

- 3 DO YOU HAVE ANY CONCERNS ABOUT THE FEEDING OR YOUR CHILD'S EATING?
A. YES B. NO
IF YES, SPECIFY

4 OBSERVER'S COMMENTS

The Child Behavior Checklist for Two-Year-Olds

Child's name _____

This form filled out by _____ Date filled out _____

People often differ in their views of a child's behavior. Please fill out this form to reflect your view of the child's behavior, even if other people might not agree about the behavior.

Below is a list of items that describe children. Please think about your child's behavior over the last two months and do the following:

If the item is not true of your child, circle the 0

If the item is somewhat or sometimes true of your child, circle the 1

If the item is often true or very true of your child, circle the 2

- | | | | |
|-------|---|---|---|
| 0 | 1 | 2 | 1. Aches or pains (without medical cause) |
| 0 | 1 | 2 | 2. Acts too young for age |
| 0 | 1 | 2 | 3. Afraid to try new things |
| 0 | 1 | 2 | 4. Always on the go |
| 0 | 1 | 2 | 5. Avoids looking others in the eye |
| 0 | 1 | 2 | 6. Can't concentrate, can't pay attention for long |
| 0 | 1 | 2 | 7. Can't sit still or restless |
| 0 | 1 | 2 | 8. Can't stand having things out of place |
| 0 | 1 | 2 | 9. Can't stand waiting; wants everything now |
| 0 | 1 | 2 | 10. Chews on things that aren't edible |
| 0 | 1 | 2 | 11. Clings to adults or too dependent |
| 0 | 1 | 2 | 12. Constantly seeks help |
| 0 | 1 | 2 | 13. Constipated, doesn't move bowels |
| 0 | 1 | 2 | 14. Cries a lot |
| 0 | 1 | 2 | 15. Cruel to animals |
| 0 | 1 | 2 | 16. Defiant |
| 0 | 1 | 2 | 17. Demands must be met immediately |
| 0 | 1 | 2 | 18. Destroys his/her own things |
| 0 | 1 | 2 | 19. Destroys things belonging to his/her family or other children |
| 0 | 1 | 2 | 20. Diarrhea or loose bowels when not sick |
| 0 | 1 | 2 | 21. Disobedient |
| 0 | 1 | 2 | 22. Disturbed by any change in routine |
| 0 | 1 | 2 | 23. Does not want to sleep alone |
| 0 | 1 | 2 | 24. Doesn't answer when people talk to him/her |
| 0 | 1 | 2 | 25. Doesn't eat well (describe): _____ |
| <hr/> | | | |
| 0 | 1 | 2 | 26. Doesn't get along with other children |
| 0 | 1 | 2 | 27. Doesn't know how to have fun, acts like a little adult |
| 0 | 1 | 2 | 28. Doesn't seem to feel guilty after misbehaving |
| 0 | 1 | 2 | 29. Doesn't want to go out of home |
| 0 | 1 | 2 | 30. Easily frustrated |

- 0 1 2 31. Easily jealous
- 0 1 2 32. Eats or drinks things that are not food (describe):_____
-
- 0 1 2 33. Fears certain animals, situations, or places (describe):_____
-
- 0 1 2 34. Feelings are easily hurt
- 0 1 2 35. Gets hurt a lot, accident-prone
- 0 1 2 36. Gets in many fights
- 0 1 2 37. Gets into everything
- 0 1 2 38. Gets too upset when separated from parents
- 0 1 2 39. Has trouble getting to sleep
- 0 1 2 40. Headaches (without medical cause)
- 0 1 2 41. Hits others
- 0 1 2 42. Holds his/her breath
- 0 1 2 43. Hurts animals or people without meaning to
- 0 1 2 44. Looks unhappy without good reason
- 0 1 2 45. Angry moods
- 0 1 2 46. Nausea, feels sick (without medical cause)
- 0 1 2 47. Nervous movements or twitching (describe):_____
-
- 0 1 2 48. Nervous, highstrung, or tense
- 0 1 2 49. Nightmares
- 0 1 2 50. Overeating
- 0 1 2 51. Overtired
- 0 1 2 52. Overweight
- 0 1 2 53. Painful bowel movements
- 0 1 2 54. Physically attacks people
- 0 1 2 55. Picks nose, skin, or other parts of body (describe):_____
-
- 0 1 2 56. Plays with own sex parts too much
- 0 1 2 57. Poorly coordinated or clumsy
- 0 1 2 58. Problems with eyes without medical cause (describe):_____
-
- 0 1 2 59. Punishment doesn't change his/her behavior
- 0 1 2 60. Quickly shifts from one activity to another
- 0 1 2 61. Rashes or other skin problems (without medical cause)
- 0 1 2 62. Refuses to eat
- 0 1 2 63. Refuses to play active games
- 0 1 2 64. Repeatedly rocks head or body
- 0 1 2 65. Resists going to bed at night
- 0 1 2 66. Resists toilet training (describe):_____
-
- 0 1 2 67. Screams a lot
- 0 1 2 68. Seems unresponsive to affection
- 0 1 2 69. Self-conscious or easily embarrassed
- 0 1 2 70. Selfish or won't share
- 0 1 2 71. Shows little affection toward people
- 0 1 2 72. Shows little interest in things around him/her
- 0 1 2 73. Shows too little fear of getting hurt
- 0 1 2 74. Shy or timid
- 0 1 2 75. Sleeps less than most children during day and/or night (describe):_____
-

- 0 1 2 76. Smears or plays with bowel movements
 0 1 2 77. Speech problem (describe): _____
 0 1 2 78. Stares into space or seems preoccupied
 0 1 2 79. Stomach aches or cramps (without medical cause)
 0 1 2 80. Stores up things he/she doesn't need (describe): _____
 0 1 2 81. Strange behavior (describe): _____
 0 1 2 82. Stubborn, sullen, or irritable
 0 1 2 83. Sudden changes in mood or feelings
 0 1 2 84. Sulks a lot
 0 1 2 85. Talks or cries out in sleep
 0 1 2 86. Temper tantrums or hot temper
 0 1 2 87. Too concerned with neatness or cleanliness
 0 1 2 88. Too fearful or anxious
 0 1 2 89. Uncooperative
 0 1 2 90. Underactive, slow moving, or lacks energy
 0 1 2 91. Unhappy, sad, or depressed
 0 1 2 92. Unusually loud
 0 1 2 93. Upset by new people or situations (describe): _____
 0 1 2 94. Vomiting, throwing up (without medical cause)
 0 1 2 95. Wakes up often at night
 0 1 2 96. Wanders away from home
 0 1 2 97. Wants a lot of attention
 0 1 2 98. Whining
 0 1 2 99. Withdrawn, doesn't get involved with others
 100. Please write in any problems your child has that were not
 listed above.
 0 1 2 _____
 0 1 2 _____
 0 1 2 _____

Please be sure you have answered all items.

APPENDIX 2 B

The Child Behavior Checklist for Ages 2-3 divided into behavior groups

Group 1: Somatic symptoms

1, 20, 40, 47, 58, 61, 79, 94

Group 2: Dependency

11, 12, 29, 38, 97

Group 3: Reserved-depressive behavior

5, 24, 25, 35, 44, 51, 63, 68, 69, 72, 74, 78, 89, 90, 91

Group 4: Aggressiveness

15, 16, 18, 19, 21, 28, 36, 41, 43, 45, 54, 59, 67, 73, 82, 84
86, 92

Group 5: Anxiety

3, 14, 23, 33, 39, 48, 49, 65, 85, 88, 93, 95, 98

Group 6: Hyperactive-impulsive behavior

4, 6, 7, 9, 17, 60, 75, 83

Group 7: Oral tendencies

10, 32, 50, 52, 62

Group 8: Anal-compulsory behavior

8, 13, 22, 42, 66, 70, 80, 87

Group 9: Regression

2, 27, 64

Items excluded

26, 30, 31, 34, 37, 46, 53, 55, 56, 57, 71, 76, 77, 81, 96, 99

